R+D 7325-MS-02

(1)

THE
DEDICATION
OF THE

NATIONAL INSTITUTE OF LASER ENHANCED SCIENCES *NILES*
CAIRO UNIVERSITY
EGYPT

LASERS & APPLICATIONS
ADVANCES IN SCIENCE, MEDICINE AND TECHNOLOGY

NILES 94

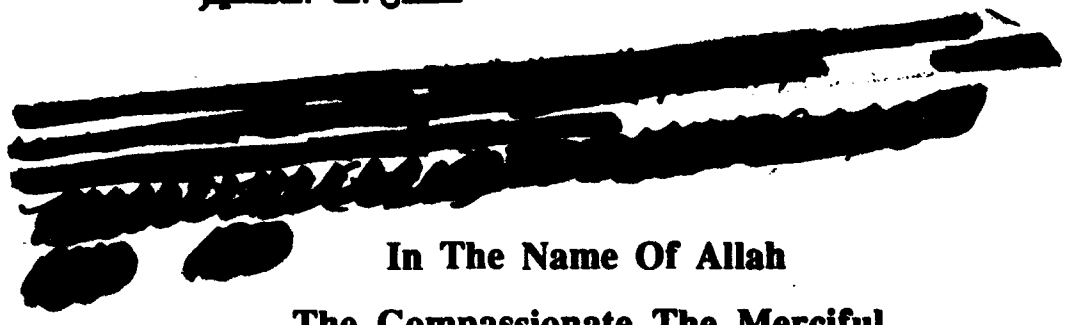
INTERNATIONAL CONFERENCE
MARCH 26-30, 1994

ABSTRACT BOOK

بسم الله الرحمن الرحيم

﴿ الله نور السماوات والأرض مثل نوره كمشكاة فيها مصباح المصباح في زجاجة الزجاجة كأنها كوكب درى يوقد من شجرة مباركة زيتونة لاشرقية ولاغربية يكاد زيتها يضئ ولو لم تمسسه نار نور على نور يهدى الله لنوره من يشآء ويضرب الله الأمثال للناس والله بكل شئ عليم ﴾

صدق الله العظيم



In The Name Of Allah

The Compassionate The Merciful

Allah is the light of the heavens and the earth. His light may be compared to a niche that enshrines a lamp, the lamp within a crystal of star-like brilliance. It is lit from a blessed olive tree neither estern nor western. Its very oil would almost shine forth, though no fire touched it. Light upon light; Allah guides to His light whom He will. Allah coins metaphors for men. He has knowledge of all things.

This translation first published 1956 by Penguin Classics Edited by E.V. Rieu

Under the Honorary Chair
of
Prof. Dr. MOUFEED SHEHAB President of Cairo Univ.

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Introductory Remarks

We are pleased that all of you can be here in Egypt on this very special occasion of the dedication of the National Institute of Laser Enhanced Sciences (NILES). This conference is regarded as the premier International Conference held in Egypt to cover state-of-the-art developments in LASER concepts and applications. Future advances in nearly all fields are also part of the discussion planned.

The conference is unique in its scope: It covers both basic and applied research and applications as it exposes the multi-applications in medicine, environment, industry and other fields. With the twenty first century at the door steps, the conference is timely and we do hope it will stimulate new ideas and collaborations for the benefit of all nations.

The program is exciting and contins contributions from allover the world by distinguished scientists, engineers and medical doctors. The format includes invited lectures, plannery lectures and keynote lectures - the first lecture will be presented by professor Nicolaas Bloembergen (Nobel Laureate) of Harvard University.

We take this opportunity on behalf of the organizing committee to welcome you to the land of Egypt - THE GIFT OF THE NILE for thousands of years!!

Conference Chairs

Lotfia El Nadi
Director, NILES
Cairo University, Egypt.

Ahmed Zewail
Linus Pauling Chair Professor
CALTECH, U.S.A.

Professor Ahmed ZEWAIL (Ph.D., D.Sc., hc) holds the Linus Pauling Chair at Caltech. He is a member of the National Academy of Sciences, fellow of the American Academy of Arts and Sciences, fellow of the Third World Academy of Sciences and a member of the European Academy of Arts, Sciences and Humanities. He has received many international distinguished honours and awards. He has given over 250 invited lectures including numerous named lectures. Over the years he has been a visiting professor to Academic Institutions in Europe, Egypt and U.S.A. He is the editor of six books, the current North American editor of chemical physics letters and International Series of Monographs in Chemistry (Oxford). The research interests of his group at Caltch are directed towards ultra fast lasers and their applications in Chemistry and Biography. Professor Zewail is proud of the achievements of his students and research scientists and with them he published some 270 articles.

Professor Dr. Lotfia EL NADI, Director of NILES has B.Sc. honour in Physics and Chemistry of Cairo Uni. (1956), M.Sc. of Birmingham University (U.K.) (1960), Ph.D. of Cairo University (1964). She started the scientific career at the Atomic Energy Authority contributing to the first nuclear research in Egypt. Since 1970 she joined Cairo Uni. as associate professor then promoted to full chair Physics Professor (1975). Recognizing the important future needs of the laser tech. she devoted her efforts since 1980 to establish the National Center of Laser & Applications (NCLA) at the Faculty of Science, which is now developed to the National Institute of Laser Enhanced Sciences (NILES) Cairo University. She also established the Topical Society of Lasers and Technology (TSLT) in 1987. She is a member of over 10 national and international scientific societies. Through her plan of technology transfer to Egypt, she implemented several bilateral international seminar, workshops, winter schools and agreements for the benefit of scientists, engineers, and medical doctors from the Egyptian Universities and institutions. With her research students she published over 50 serious papers. Her current interest concerns the associated phenomena of laser matter interaction as well as the development of solar pumped lasers for energy conversion.

PROGRAMME OVERVIEW NILES 94 26-30 March

Day / Time	25/3 Fri	26/3 Saturday	27/3 Sunday	28/3 Monday	29/3 Tuesday	30/3 Wednesday
Morning 09:00			INV. LEC A B C	INV. LEC A B C	INV. LEC A B C	INV. LEC A C
	A	REGISTRATION	Session 4	Session 9	Session 14	Session 19
	R		Room	Room	Room	Room
10:00			IL-S A	IL-S A	IL-S A	IL-S A
	R	OPENING	OP-S	OP-S	OP-S	OP-S
		CEREMONY	IL-M B	IL-M B	IL-M B	
	I	AT	OP-M	OP-M	OP-M	
		NILES	IL-T C	IL-T C	IL-T C	IL-T C
			OP-T	OP-T	OP-T	OP-T
11:30	V		COFFEE	BREAK		
	A	DEDICATION OCD				
	L		KN-SC,E	KN-M,H	KN-EN,A	CLOSING
		AWARDS				
	S		Session 5	Session 10	Session 15	Session 20
12:30			QUICK	LUNCH &	EXHIBIT	P
Afternoon 13:30	T	OPENING LEC. Session 1	PLENARY-1 Session 6	PLENARY-2 Session 11	PLENARY-3 Session 16	O
	O		TEA	BREAK		S
14:15		INV. LEC A B	INV. LEC A B C	INV. LEC A B C	INV. LEC A B	T
	C	Room	Room	Room	Room	
	A	IL-S A	IL-S A	IL-S A	IL-S A	
		OP-S	OP-S	OP-S	OP-S	
	I	IL-M B	IL-M B	IL-M B	IL-M B	C
		OP-M	OP-M	OP-M	OP-M	O
	R	Session 2	Session 7	Session 12	Session 17	N
			SOFT	DRINK	BREAK	
16:00	O	TUTORIAL-1	TUTORIAL-3	TUTORIAL-6,7	TUTORIAL-9	F.
		TUTORIAL-2 Session 3	TUTORIAL-4 Session 8	TUTORIAL-8 Session 13	TUTORIAL-10 Session 18	
17:30			FREE	TIME		A
EVENING 19:30			SOCIAL	RECEPTION		C
	W					T
	E	UNIVERSITY	NILE		CONFERENCE	
	L	DINNER	CRUISE	FREE	BANQUET	I
	C		DINNER			
	O					V.
	M					
	E					

N.B. (1) Morning session of 26/3/94 will be held at NILES new premises.

(2) All sessions starting afternoon session 13:30 of 26/3/94 will be held at the OPEN UNIVERSITY LEARNING CENTER OLC, few meters away from NILES.

SCHEDULE NILES 94 TECHNICAL PROGRAMME

I– OPENING LECTURE — Location Conference Room OLC

SATURDAY MARCH 26, 1994

Session 1 (Afternoon) **13:30-14:00**

OL- **Ahmed Zewail,** California Institute of Technology (USA)
objectives of the conference

II- KEYNOTE LECTURES — Location Conference Room OLC

SUNDAY MARCH 27, 1994

Session 4 (Morning) **11:30-12:30**

Chairman: **Ahmed Zewail.**

KN-1 **N. Bloembergen,** Noble laureate, Harvard University (USA),
Laser Material Interactions: Fundamentals & Applications.

MONDAY MARCH 28, 1994

Session 9 (Morning) **11:30-12:30**

Chairman: **Sayed H. Seif.**

KN-2 **H. Van Den Bergh,** Swiss Federal Institute of Technology (Switzerland)
Lasers in Medicine.

TUESDAY MARCH 29, 1994

Session 14 (Morning) **11:30-12:30**

Chairman: **A.S. ELRaei**

KN-3 **Sune Svanberg,** Lund Institute of Technology, (Sweden)
Monitoring of Atmospheric Pullutants and Vegetation Stress Using Laser Techniques.

III– PLENARY LECTURES — Location Conference Room OLC

SUNDAY MARCH 27, 1994

Session 6 (Afternoon) **13:30-14:00**

Chairman: **Shoukry Hunter.**

PL-1 **Leon Goldman,** United States medical Center, San Diego (USA)
The Glorious Future of Laser Medicine and Surgery.

MONDAY MARCH 28, 1994

Session 11 (Afternoon) **13:30-14:00**

Chairman: **Farouk Ismail.**

PL-2 **L. Woste,** Freie Universitat Berlin (GERMANY)
Monitoring Atmospheric Polutions by LIDAR.

TUESDAY MARCH 29, 1994

Session 16 (Afternoon) **13:30-14:00**

Chairman: **M. Geneedy**

PL-3 **C. Grey Morgan,** Swansea University (UK)
Laser Spectroscopic Applications in Medicine and Industry.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **KN-1, Sun., 27, 11:30**

Laser Material Interactions; Fundamentals and Applications

N. Bloembergen
Pierce Hall,
Harvard University,
Cambridge, MA 02138,
U.S.A.

Abstract: The interaction of light with matter leads to electronic exictation by the absorption of photons. A large fraction of the high excitation energy of the electrons is transformed into heat on a time scale of about one picosecond in many circumstances. With lasers, power flux densities or intensities exceeding a terawatt/cm2 are readily achieved and any material may be converted into a high temperature plasma. The material response has been investigated over a wide range of intensities and irradiation times. Applications include heat treatment and ablation of surfaces, cutting, dirilling and welding of a wide variety of materials, laser recording and printing, and laser surgery. Phase transitions induced by ultrashort femtosceond laser pusles enlarge our understanding of materials under extreme conditions of pressure and temperature.

Summary:

References:

Professor Blomembergen is one of the great scientists and educators of the last four decades. The Nobel prize of Physics in 1981 is just one of a number of testimonies to his impact on science.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-18, Tue. 29, 10:30**

Photodynamic Therapy and Photodetection of Early Cancer

Hubert van den Bergh
Ecole Polytecnique
Federale De Lausanne
Switzerland

Abstract:

Summary: The optical properties of dyes that localised preferentially in superficial early cancer can be used to detect and treat the malignant tissue. For phtodetection we use the fluorescent properties of these dyes. For photodynamic therapy (PDT) dyes are selected with high triplet yields and long triplet lifetimes that can give rise to efficient singled oxygen production which results in local phototoxicity and destruction of the neoplastic tissue.

Both PDT and photodetection are based on local changes in dye concentration in a cancer which may be either normal or induced. Several approaches are used to target malignant tumours with dyes, including attaching dyes to monoclonal antibodies, to polymers with long plasma lifetimes, and to low-density lipoproteins. One can also selects particular molecular properties which cause enhanced concentrations in tumours like the use of certain tetrapyrrols or lipophilic cationic dyes. Other strategies involve applications of γ-leveulinic acid which interferes with the natural synthesis of heme by excess of protoporphyrin X production, the use of liposom carriers, etc.

Over the past ten years, in a collaboration between the CHUV hospital in Lausanne, the Swiss Federal Institute of Technology (EPFL), the University of Lausanne, and Ciba-Geigy in Basel, we have developed effective clinical photodetectoin and photodynamic therapy. We have focused mainly on early superficail squamous cell cancers of the upper acrodigesive tract, the tracheobronchial tree and the esophgus. As an example, one may mention PDT of carcionma in situ in the above mentioned parts of the body, where with a follow up between one and nine years the 15 patients treatd showed no recurrence at all as checked byk local biopsy. We have also developed sophisticated apparatus for endoscopic detection of early cancer by light induced fluriesence (LIF) which permits localizatoin of sub-mm3 superficial tumors. LIF spectroscopy is also used for non-invasive clinical pharmacokinetics of new dyes by means of a fiberoptic based optical multichannel analyzer.

PDT with the early drug photofrin II is now an accepted treatment for bladder cancer in Canada. Eight new substances are underging PDT clinical trials at present. Furthermore, the combination of light and drugs is not only being investigated for cancer treatment but also for other diseases like psoriasis and atherosclerosis.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **KN-3, Tue. 29, 11:30**

Monitoring of Atmospheric Pollution and Vegetation Stress using Laser Tehniques

S. Svanberg
Department of Physics, Lund Institute of Technology.
P.O. Box 118,S221 00 Lund, Seweden

Abstract: Laser remote-sensing techniques, in a particular differntial absorption and fluorescence lidars provide powerful means for monitoring the atmosphere and the status of vegetation. Three-dimensional mapping of industrial polutants and geothermal emissions (including from volcanoes) is described. Remote fluorescene point monitoring and multi-color imaging are described providing information on green plants and trees.

Summary: There is an increasing need for powerful monitoring techniques to assess the status of the environment, regarding the atomosphere, the hydrosphere as well as the ground and its vegetation. Laser remote-sensing techniques, in particular differential absorption and fluorescence lidars provide means for monitoring the atmosphere and the status of vegetation. A mobile laser radar system is presented and three-dimensional, mapping of industrial polutants and geothermal emissions (including from volcanoes) is described. With the system fluxes of SO_2, NO_2, NO, O_3 and Hg can be determined. Monitoring at major Swedish industrial installations is described and the results from monitoring in Italian geothermal fields as well as from measurements on Mt Etna and Stromboli are presented.

Remote fluorescence point monitoring and multi-color imaging are described providing information on green plants and trees. Several tests with the fluoresscence lidar technique have been made within the framework of the European LASFLEUR performing work together with plant physiolgoists a deeper understanding of the mainfestations of environmental stress in plants is sought. Fluroescence techniques are also useful for water pollution monitoring and results from field tests at Mediterrenean sites are presented.

References:
1. S. Svanberg, Differential absorption lidar (dial), Chapter 3 in *Air Monitoring* by Spectroscopic Techniques, ed. M. Sigrist (Wiley, New York 1994).
2. H. Edner, J. Johansson, S. Svanberg and E. Wallinder, Fluroescence Lidar Multi-Color Imaging of Vegetation, Appl. Optics, in press

Dr. Sune Svanberg is professor of Physics with advanced experience in spectroscopic techniques. He is the head of the physics dept. at the Lund Institute of Technology.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **PL-1, Sun. 27, 13:30**

The Glorious Future of Laser Medicine and Surgery

Leon Goldman, M.D.
Laser Consutltant Room 611
United States Naval Medical
Center San Diego California
U.S.A.

Abstract:

Summary: With the great developments in optoelectronics, laser medicine and laser surgery will continue to have a glorious future. Laser dermatology research and develpments will lead to new applications in many disciplines in medicine and surgery. Diagnostics, one of the important aspects of laser medicine, will continue to show bettter imagery of living tissue, including pathological tissue. Photography, in color, wil include 3D imagery. Various types of microsocopes will be used for living tissues. These microscopes will includes types of polarizing microscopes and even our current studies on scanning confocal microscopy for the skin and for the translucent endocardium. The important clinical studies on microscopy for living tissues include early diagnositcs of melanoma and for vascular aspects of cardiology. New developments in lassr surgery include smaller more flexible less expensive laser surgical instruments. The important new instruments will include lasers with multiple wave length lasers, with multiple applications in the single OPO unit instead of the use of multiple lasers. The increasing incidence of the epidemic of AIDS means an increasing special laser safety for surgery in AIDS, especially laser surgery. We are developing new safety resistant surgical gloves, new respiratory systems, electrosurgical and Q switch laser protection. The new laser safety programs for AIDS will extend the use of laser treatments for AIDS. A new laser safety program also will have to be developed for the multiwave length laser of the future, the OPO, optical parametric oscillator.

References:

Professor Dr. Leon Goldman MD, is the Professor Emeritus at the Dermatology college of Medicine University of Cincinnati.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **PL-2, Mon.29, 1330**

Monitoring Atmospheric Polutions of Lidar

L. Woste
Freie Universitat
Berlin (Germany)

Abstract:

Summary:

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **PL-3, Tue. 29, 13:30**

Laser Spectroscopic Applications in Medicine and Industry.

Colyn Grey Morgan
Phys. Dept.,
University of Wales,
U.K.

Abstract: I want to talk about two of these subjects: vastly different types of laser-produced ionization and their uses in analytical spectroscopy with reference to medical, industrial and environmental problems. The first will be Laser-Induced Breakdown Spectroscopy (LIBS), and the second will be Resonance Ionization Mass Spectroscopy (RIMS).
Atomic and molecular ionization by laser photon irradiation of gases, liquids and solids is well known and has been extensively used for analytical purposes. The fundamental physical processes, namely, multiphoton absorption and inverse Bremsstrahlung absorption are already well documented.

Summary:

References:

IV CONFERENCE THEME SCIENCE & ENERGY (Location Room A OLC)

Prograamme Chair : Eduard HINTZ, Institute of Plasma Physics, KFA Julich (GERMANY)
Programme Committee : Ebtisam HAVEZ, Farouk HAMMODA and A. NASSER (NILES)

SATURDAY MARCH 26, 1994

Session 1 (SEE PLENARY SESSION LECTURES) **12:30-14:00**

TEA BREAK (Location Cafeteria of OLC 3rd floor) **14:00-14:15**

Session 2 (Afternoon) **14:15-15:45**

Theme Chairs: **Mohamed El Nady, M. Masoud.**

IL-S-1 **Eduard Hintz**, Institute Plasma Physics, KFA (GERMANY) 14:15-14:45
Application of LIF of Atoms and Ions to the Study of Glow Discharge.

IL-S-2 **H.F. DOBELE**, University Gesamthochschule Essen (GERMANY)
Laser Plasma Diagnostics Using TWO Photon Excitation. 14:45-15:15

OP-S-1 **Sh.M. Khalil**, Plasma Physics Dept., AtomicEnergy Authority (EGYPT) 15:15-15:25
Interaction of waves of Differnet Polarization.

OP-S-2 **M.Atta**, NILES, Cairo University, (EGYPT) 15:25-15:35
Microarc Plasma Diagnostics Using LIF Techniques.

OP-S-3 **Sh. M. Khalil**, Plasma Physics Dept., AtomicEnergy Authority (EGYPT) 15:35-15:45
Interaction of waves of Similar Polarization.

SOFT DRINK BREAK (Location Cafeteria OLC 3rd floor) **15:45-16:00**

Session 3 (SEE TUTORIAL SEMINARS) **16:00-17:30**

SUNDAY MARCH 27, 1994

Session4 (Morning) **9:00-11:15**

Theme chairs: **H.F. Dobele, Henry Kapteyn.**

IL-S-3 **V. Mckoy**, Calfornia Institute of Technology (USA) 9:00-9:30
Laser Photo Electron Spectroscopy.

IL-S-4 **Margret Murnane**, Washington State University (USA) 9:30-10:00
Ultra Short Pulse Laser and applications.

IL-S-5 **Roman Sobolewski**, Laboratory of Laser Energetics, 10:00-10:30
Rochester University (USA)
Fembosecond Lasers in Science and Engineering.

OP-S-4 **S.I. Hassab El Naby**, Air Defence College & NILES (EGYPT) 10:30-10:40
The Compression Mechanism of th Passive Mode-Locked Ti-sapphire laser.

OP-S-5 **A. Nasser**, Faculty of Science & NILES (EGYPT) 10:40-10:50
Laser Initiated Surface Pressure.

OP-S-6 **A.F. El Sherbini**, Faculty of Science & NILES (EGYPT) 10:50-11:00
Laser Produced Carbon Plasma.

OP-S-7 **G. Abdel Latif**, Faculty of Science & NILES (EGYPT) 11:00-11:10
Diagnostics of Laser Produced Soft-x-rays.

COFFEE BREAK (Location cafeteria of OLC 3rd floor) **11:15-11:30**

Session 5 (SEE KEYNOTE LECTURES) **11:30-12:30**

QUICK LUNCH & EXHIBITION (Location OLC & Univ. Guest House) **12:30-13:30**

Session 6 (SEE PLENARY LECTURE)	**13:30-14:00**
TEA BREAK (Location Cafeteria OLC 3rd floor)	**14:00-14:15**
Session 7 (Afternoon)	**14:15-15:45**

Theme charis: **V. Mckoy, Roman Sobolowski.**

IL-S-6 **Henry Kapteyn,** Washingon University (USA) 14:15-14:45
High Intensity Physics with 20 Femto-second Laser Pulses.

IL-S-7 **Peter Bogen,** Institute of Plasma Physics, KFA (GERMANY) 14:45-15:15
LIF Experiments in the VUV.

IL-S-8 **Eduard Fabre,** Ecole Polytechnique (LULI) (FRANCE) 15:15-15:45
Laser Fusion Overview.

SOFT DRINK (Location cafeteria of OLC 3rd floor)	**15:45-16:00**
Session 8 (SEE TUTORIAL SEMINAR)	**16:00-17:30**

MONDAY MARCH 28, 1994

Session 9 (Morning)	**9:00-11:15**

Theme chairs: **Abdel Kader Mansour, Roland Bonneau.**

IL-S-9 **J.P.Mitttal,** Bhaba Atomic Research Centre (INDIA) 9:00-9:30
Lasers in Chemistry & Chemistry in Lasers.

IL-S-10 **J.C. Whitehead,** University of Manchester (UK) 9:30-10:00
The Development of short-Wavelength Chemical lasers.

IL-S-11 **W. Hutner,** Ulm University (GERMANY) 10:00-10:30
High Resolution Molecular Laser Applications in External Fields.

IL-S-12 **Ideisan Abu Abdoun,** King Fahd University of 10:30-11:00
Petrolium and Minerals (SAUDI ARABIA)
Photoinitiators for Polymerization Reactions.

OP-S-8 **M. Farhoud,** Alexandria Univ. (EGYPT) 11:00-11:15
Non linear effect for Solute - Solvent Interaction in Aqueous Solutions.

COFFEE BREAK (Location cafeteria OLC 3rd floor)	**11:15-11:30**
Session 10 (SEE KEYNOTE LECTURES)	**11:30-12:30**
QUICK LUNCH (Location cafeteria OLC & Univ. Guest House)	**12:30-13:30**
Session 11 (SEE PLENARY LECTURES)	**13:30-14:00**
Session 12 (Afternoon)	**14:00-15:45**

Theme chairs: **Sabry Abdel Mottaleb, J.P. Mittal**

IL-S-13 **Aldo Mele,** University La Sapienza Roma (ITALY) 14:00-14:30
Evolution ad Dynamics of the laser Ablated Plume.

IL-S-14 **Helmy El Nagdy,** Cairo Univ. & NILES (EGYPT) 14:30-14:50
Advances of Laser Methods in Chemistry.

Il-S-24 **Sabry A. Mottaleb,** Ain Shams Univ. (EGYPT) 14:50-15:10
photophyscal Properties of Some Laser Dyes

OP-S-9 **Maram. T. Hussine,** Cairo Univ. NILES (EGYPT) 15:10-15:20
Studies on the Optical Properties of Some Ccoumarines as Laser Dyes

OP-S-10 **G.E. Hassan,** Tanta Univ. (EGYPT) 15:20-15:30
Measurement of the Physical Properties of Cyclohexane using Laser Interferometric Technique.
OP-S-11 **Kawser Kassab,** Cairo Univ. NILES (EGYPT) 15:30-15:40
Synthesis of new Heterocyclic Coumarine Derivatives as Laser Dyes.
OP-S-12 **Reda A. El Koramy,** Assuot Univ. (EGYPT) 15:40-15:50
Dependence of the Complete Absorption on the Absorbent Concentration.

SOFT DRINK (Locations cafeteria OLC 3rd floor) 15:45-16:00

Session 13 (SEE TUTORIAL SEMINARS) 16:00-17:30

TUESDAY MARCH 29, 1994

Session 14 (Morning) **9:00-11:15**

Theme chairs: **Latifa Al Houty, W. Hutner.**
IL-S-15 **P. Dhez,** Univ. Paris Sud (LSAI) (FRANCE) 9:00-9:30
Present status of X-UV lasers: New Lasing Lines Towards "Table Top" system.
IL-S-16 **Frank Tittel,** Rice Univ. (USA) 9:30-10:00
New Opportunities in IR Laser Spectroscopy.
IL-S-17 **B. Chai,** Univ. of Central Florida (USA) 10:00-10:30
New Solid State Laser Materials in Research and applications.
IL-S-18 **Latifa Al Houty,** Qatar Univ. (QATAR) 10:30-11:00
Prospects of Laser Science at Qatar University.
OP-S-13 **Essam Hassan,** Cairo Univ., NILES (EGYPT) 11:00-11:15
Solar Pumped Iodine compound laser.

COFFEE BREAK (Location cafeteria OLC 3rd floor) 11:15-11:30

Session 15 (SEE KEYNOTE LECTURES) 11:30-12:30

QUICK LUNCH (Location Cafeteria OLC Univ. Guest House) 12:30-13:30

Session 16 (SEE PLENARY LECTURES) 13:30-14:00

TEA BREAK (Location cafeteria OLC 3rd floor) 14:00-14:15

Session 19 (Afternoon) **14:15-015:45**
Theme chairs: **Frank Tittel, Aldo Mele**
IL-S-19 **Sohair Negm,** Zagazig University (EGYPT) 14:15-14:45
Comparative Spectra Response of PTD and PAS Techniques.
IL-S-20 **Lotfi Ismail,** Qatar Univ. (Qatar) 14:45-15:15
Novel Nitrogen Laser in Ring Cavity.
IL-S-21 **H. Welling,** Univ. of Hannover (USA) 15:15-15:45
Diode pumped solid state lasers operating at low Amplitude and Frequency Noise.

SOFT DRINK (Location cafeteria OLC 3rd floor) 15:45-16:00

Session 18 (SEE TUTORIAL SEMINAR) 16:00-17:30

WEDNESDAY MARCH 30,1994

Session 19 (Morning) **9:00-11:15**

Theme chairs: **Peter Dhez, A.A.Hamza**

IL-S-22 **A.A. Hamza,** Mansourah Univ. (EGYPT) 9:00-9:30
Interferometry & Future Expectations.

IL-S-23 **M.A. Khashan,** Ain Shams Univ. (EGYPT) 9:30-10:00
Determination of Level Population from the Dispersion Measurements in Doublet-line Wings.

OP-S-14 **A.R. El Samman,** Al Azhar Univ. (EGYPT) 10:00-10:15
Quantum Statistics of a 3-Level Atom + Multiphoton Two-Mode Field (1) Photon bunching & Antibunching.

OP-S-15 **M. Omar,** Cairo Univ., NILES (EGYPT) 10:15-10:30
Photo Deflection Studeis from Microarc Produced Plasma.

OP-S-16 Afaf Gadallah, Assiut Univ. (EGYPt) 10:30-10:45

COFFEE BREAK (Location cafeteria OLC 3rd floor) **11:15-11:30**

Session 20 CLOSING SESSION **11:30**

Application of the Laser Induced Fluorescence of Atoms and Ions to the Study of Glow Discharges

E. Hintz, V. Scheid and B. Schweer

Forschungszentrum Jülich GmbH, Association EURATOM-KFA, Institut für Plasmaphysik, 52425 Jülich

DC- and RF-glow discharges are frequently employed in plasma technology, in particular, for sputtering. Discharges in argon typically have a cathode voltage of a few kV, a pressure in the range of 0.01-0.1 mbar, and a current density of a few tenths mA/cm^2. Under such operating conditions, the discharge is in the abnormal range of the current voltage characteristic and shows, adjacent to the cathode fall, a pronounced negative glow.

The plasma in the negative glow region of abnormal discharges in argon is generated by an electron beam emerging from the cathode fall. Although the electric field is small throughout the negative glow and, with properly chosen discharge conditions, the ionization of the gas atoms is predominantly due to the beam electrons, the description of the plasma is quite complicated. This follows partly from the observation, that the electron gas consists of three important components: the beam electrons, a low energy group (a few tenths eV) and a high energy group (a few eV). The interaction of this kind of plasma with the neutral and ionized metal atoms originating at the cathode by sputtering and with the gas atoms is of great interest. On the one hand the ionization and transport processes, acting on these particles are important for the optimization of the technological process on the other hand their behavior and that of the metastable argon atoms is of interests from a basic physics point of view.

The laser induced fluorescence (LIF) of atoms and ions offers the possibility to measure selectively the density of these particles in specific electronic states and in well defined velocity intervals. The measurements can be performed locally with high space resolution, with high sensitivity and without the knowledge of additional plasma parameters like electron density n_e and electron temperature T_e. These features make the application of this method to the investigation of plasmas with strong gradients and far from thermal equilibrium very attractive. Accordingly it is employed increasingly for the study of the electrode-near region of glow discharges. We have used LIF to elucidate the transport and ionization of sputtered metal atoms and ions and of the metastable argon atoms. These studies included, in particular:

- The absolute measurement of radial and axial density distributions of metal atoms, of metal ions and of the metastable argon atoms
- the measurement of the population density of the fine structure of the groundstate of metal atoms and, based on these data, the determination of the spatial distribution of the gas temperature.
- the measurement of the velocity distribution of the metal ions

We shall present a survey on these studies, show some of the results and attempt an interpretation of the observations.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-2, Sat. 26, 14:45**

Laser-Plasma Diagnostics Using Two-Photon Excitation

H.F. Dobele
Institute fur Laser-und Plasmaphysik Universitat-GH Essen,
45117 Essen, Fed. Rep. Germany.

Abstract: Light atoms like H and O play an important role both in fusion research (Plasma-wall interaction studies) and in technical plasmas in the frame of material sciences. The method of two-photon excitation with fluorescence detection is discussed with respect to applications in connection with H and O atoms and is compared with single photon excitation schemes. Methods of absolute calibration are discussed as well as limiting mechanisms in the high density regime. New concepts based on these experiences are proposed and discussed.

Summary:

References:

Professor Dr. H.F. Dobele is the director of the Institute of lasers and plasma physics at the University of Essen. He developed a strong school in laser and laser plasma diagnositc laboratories using excimer and other important techniques.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **OP-S-1, Sat. 26, 15:15**

I. Intenteraction of Waves of Different Polarization

Sh. M. Khalil
A.I. Mahdy
Kh. H.El Shorbagy
Plasma Physics Dept.
Atomic Energy Authority,
Cairo, Egypt.

Abstract: Generation of waves at second haromonics and combined frequencies due to nonlinear interaction of obliquely incident pumping P-polarized light wave with S-Polarized surface wave in an inhomogeneous plasma is investigated. The effect of an external oscillating inhomogeneous magnetic field is considered. Effect of polarization types on the generated waves is studied. Further, the applicability of our results for rarefied plasma and normal incidence are also studied.

Summary: In this work we consider a P-Polarized light wave (have frequency w1) is obliquely incident from vacuum on a thin inomogeneous plasma layer of width d to pump S-polarized surface wave (have frequency w2) propagates on the vacuum-plasma boundary. The non-linear interaction of these waves generates S-polarized waves at combined frequencies and P-polrized waves at second harmonics.

We consider the effect of external oscillating inhomogeneous magnetic field perpendicular to the gradient of the unperturbed plama density in the layer. This field oscillates at arbitrary frequencies Wm=W1, W2, 2W1, 2W2 and w1+w2. Inohmoeneity of the magneitic field is found to support its oscillation, i.e. damping or amplification of generated waves. We calcuate the current velocity, both electric and magnetic field components, and amplitudes for the fundamental and generated waves. Previous works considered the effects of an external static magnetic field [e.g., 1,2].

References:

1. Sh. M. Khalil, A.I. Mahdy and K.H.El-Shorgbagy: presented to NILES 94 International conference, March 26-30, 1994, Cairo. (accepted for oral presentation on 27 March 94).
2. Sh. M. Khalil, I.A. El-Naggar, Y.A. Sayed, and R.N.El-Sherif, Int. J. Thorietical Phys., 24 (1985) 1001

Plasma Physics and Nuclear Fusion Dept.
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Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **OP-S-3, Sat. 26, 15:35**

II- Interaction of Waves of Similar Polarizatoin

Sh. M. Khalil
Y.A. Sayed
W.H. Amein
A.I. Mahdy
Plasma Physics

Abstract: The non linear generation of waves at combined frequencies in a thin inhomogeneous plasma layer due to interaction of waves have similar polarization (either S- or P-Polarized) is analyzed. The effect of an external inhomogeneous magnetic field oscillating at high frequency is considered. Oscillation of the magnetic field and type of polarization are found to affect, strongly, the generated wave.

Summary: In this paper we investigate the wave generation at combined frequencies due to non-linear interaction of incident light-wave (have a frequency w1) and surface wave (have frequency w2) propagates on the boundary separating a thin plasma layer immersed in vacuum.
The interacting waves have similar poarization, either P- or S-Polarized. Different from part I of this work [1], the generated waves at combined frequencies are found to be of P-polarization. We consider also the effect of external applied high frequency osciallating magnetic field talking into account the spatial inhomogeneity associated with its oscillation. The problem is investigated for different frequencies of this field, i.e., at Wm = w1, w2 and (w1 + w2). The cases of rarefied plasma and normal incidence light-wave are also studied.

References:

1. Sh. M. Khalil, A.I. Mahdy and K.H.El-Shorgbagy: presented to NILES 94 International conference, March 26-30, 1994, Cairo. (accepted for oral presentation on 26 March, 1994).

Plasma Physics and Nuclear Fusion Dept.
Nuclear Research Center
Atomic Engergy Authority
Cairo, Egypt.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-S-2, Sat.26, 15:25**

Micro-arc Plasma diagnostics using LIF Technique

M. Atta
H. M. Abd El Monem
Lotfia El Nadi
NILES, Cairo University.

Abstract: The neutral Ti vapour density at the center of normal axis in front of Ti cathode surface has been determined by laser - induced - fluorescence (LIF) techniques. the velocity distribution was measured by means of the time of flight measurements. The recovery data were obtained of, vacuum arcs following high voltage pulses cause breakdown through the gap and the current was focused to zero sharply at its maximum in about 1 μs. The tuning dye laser beam pumped by N2-laser or N2-laser beam has been reaching to the plasma after few micro seconds after current zero. The density of neutral particles is related to the time after the discharge by exponent shape.

Summary: In order to determine the velocity and density distribution of the titanium atoms, the laser induced florescence method was applied.
The laser wavelength was adjusted to be 588.392 nm after doubling the output frequency by the kDP crystal a laser wavelength 294.196 was obtained by using laser pumped by N2 laser or adjusted at 337.1 nm from N2 laser directly and focused by spherical lens on the micro arc plasma. The emitted fluorescence radiation of wavelength 445.33 nm using the interference filter of maximum transmission at 400 nm and prevent the pumping wavelength to penetrate the photo multiplier. The electrical circuit and electrode system has been described by (3) by changing the delay time between laser and Micro-arc pulses the data shows that the density distribution has an exponent function of the time and the velocity distribution in the range of 0.5-3 * 105 cm/s.
These measurement are in good agreement with other authors.(1), (2)

References:
1. G. Lins and W. Hartman XVth Int. symposium on Dischasrges and electrical Insulation in Vacuum - Ddarmstadt 1992.
2. H. M. Abd El Monem Ph.D. of vacuum arc, Physics Department, Faculty of Science Cairo University 1985.
3. M. Atta et al., "Study of Vacuum arc on graphite" xxIst. International Conference.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-3, Sun. 27, 9:00**

Laser Photoelectron Spectroscopy of Molecules

Vincent McKoy
California Institute of Technology,
Pasadena, California.

Abstract:

Summary: The intense and narrowband radiation of lasers has made possible significant advances in high-resolution photoelectron spectros copy of molecules. The rotational distributions of molecular ions that can now be obtained with these laser techniques provide significant insight into the dynamics of molecular photoionization. In this talk I will discuss results of recent theoretical and experimental studies of such molecular photoelectron spectra for several molecules which will serve to illustrate the insight that these quantum-state studies of molecular phtoionization provide.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-4, Sun. 27, 9:30**

Ultrashort Pulse Lasers

Margaret M. Murnane and
Henry C. Kapteyn
Department of Physics
Washington State University.
Pullman, WA 99164-2814

Abstract:

Summary: Recent advances in all-solid state ultrafast laser technolgy have made possible the generation of ultrashort pulses of unprecedented duration and power. It is now possible to routinely generate near-transform-limited pulses, of duration less than 9 femtoseconds, and bandwidths greater than 170 nm, from a simple laser oscillator. We have recently generated pulses as short as 8.5 fs directly from a self-modelocked Ti:sapphire laser, with a pulse duration limited by fourth order dispersion. We have also demonstrated intracavity frequency doubling in a Ti:sapphire laser, which has led to the generation of 14 fs pulses in the blue region of the spectrum.

References:

1. D.E. Spence, P.N. Kean, W. Sibbett, Opt. Lett. 16, 42 (1991).
2. M.T. Asaki, C.P. Huang, D. Garvey, J. Zhou, H.C. Kapteyn, M.M. Murnane, Optics Letters 18, 977 (1993).
3. J. Zhou G. Taft, C.P. Huang, M.M. Murnane, H.C. Kapteyn, I. Christov, submitted to Optics Letters, (1994).

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-5, Sun. 27, 10:00**

Femtosecond Lasers in Science and Engineering

Roman Sobolewski
Laboratory for Laser Energitics
and Dept. of Electrical Eng.
Univeristy of Rochester
Rochester,, NY 14627, U.S.A

Abstract: We review current state-of-the-art in the ultrafast laser technology and discuss applications of femtosecond lasers in the experimental solid. state physics and ultrafast, high-performance electronics and optoelectronics.

Summary: Recent progress in the field of ultrafast lasers has opened new possibilities for time-resolved physical experiments on femtosecond time-scales. Femtosecond colliding pulse mode locked dye lasers and, most recently developed, solid state titanium-doped sapphire systems have been during the last ten years implanted in studies of a side variety of materials, ranging from metals, semiconductors, and superconductors to organic macromolecules and polymers. In this presentation, we review femtosecond pump-probe studies, performed at our group, on free carrier dynamics in compound semiconductors (e.g. GaAs, InP) and high temperature superconductors ($YBa_2Cu_3O_{7-x}$). We also discuss applications of femtosecond lasers in ultrafast electronics and optoelectroncis. In particular, we present how ultrashort optical pulses can be used, via photo conductive effect, for the generation of sub-picosecond electric transients. And how the electro-optic sampling system can be applied for the terahertz waveform measurements and to the determination of the properties of various thin film transmission structures.

References:

Dr. Roman Sobolewski is a Senior Scientist and Associate Professor in the Laboratory for Laser Energetics and the Department of Electrical Engineering of the University of Rochester, Rochester, NY. His current research interests focus on ultrafast phenomena in solids and new device-concepts for high-performance, ultrafast electronics and optoelectronics.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **OP- S-4, Sun 27, 10:30**

The Compression mechanism of the passive Mode-Locked Ti-Sapphire laser

S.I.Hassab Elnaby
Niles, Cairo University
A.M. Assar .
Military Technical College
A.B. Abo El Yazeed
Air Defence College

Abstract: Computer models are of great importance in studying and developing of passive mode-locking of laser systems. We present here a fluctuation model for the passively mode-locked Ti-sapphire laser with DDI as a saturable absorber. The compression mechanism and the effect of adding fast recovery time dyes to the absorber are studied. Also effects of the pumping power and the absorber concentration on the pulse width are presented.

Summary: Passively Mode-Locked Solid State Lasers are of high importance as sources of light pulses with picosecond and femtosecond durations. The Ti: sapphire laser is a typical example. In this paper we applied a fluctuation model for the passively mode locked CW Ti-sapphire laser with 1, 1- diethyl-2, 2-dicarbocynine iodide (DDI) dye as saturable absorber. The pulse evolution from initial noise like signal into a single picosecond pulse and the pulse width compression are investigated. Also Malachite Green (MG) dye to the saturable absorber (DDI) on the compression mechanism. Finally the effects of the pumping power and the saturable absorber concentration on the pulse width are studied. From the results we concluded that shorter pulses could be achieved with addition of M.G dye, operating near the threshold pumping power and higher saturable absorber dye concentration.

References:
1. N. Sarkura, Y. Ishif, H. Nakano and Y.Yamato 1990 Apl Phys. Lett. 56 814.
2. S.I. Hassab Elnaby, A.M. Assar and A.B. Abo Elyazeed, accepted for publishing Indian J.Phys.
3. A. atanabe, H. TAkeumura, S. Tanata, H. Kobayoshi and M. Hara 1983 IEEE J. Quantum Electron E-19 533.

A.B. Abo El Yazeed was born in Cairo in 1950. He received the B.Sc. degree from the Military Technical College 1974. He is presently working towrds the Ph.D. degree with a concentatin in Ultra fast phenomena at the Military Technical College.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-S-6, Sun. 27, 10:50**

Laser Produced Carbon Plasma

A.F. Sherbini
M. Abd El Nasser
M.M. Omar
Lotfia El Nadi
NILES, Faculty of Science,
Cairo University.

Abstract: Carbon produced plasma due to focused Co_2 - Laser irradiance of - 10^8 W/Cm^2 on a graphite targets under vacuum were studied. Spatial electron density distribution and plasma temperature profile along the produced plasma cloud were obtained suing probe measurements for different laser energies. Ion expansions velocities were determined using time of flight technique. The scaling of the plasma parameters are compared to the predictions of the self - Regulating Model

Summary: Up to 8.2 J/cm^2 laser pulses provided by a focused multimode TEM CO_2 laser, were focused on pure carbon graphite targets. Irradiance took place under vacuum of 10^{-5}or in a direction perpendicular to the target surface. Peak power densities of up to 10^2w/cm^2 were achieved with laser pulse duration of 150 ns. This power densities produced a transient near source plasma cloud which expands axially in opposite direction to the incident beam. Electron densities up to 10^{18} m^{-3} and the average electron temp. up to 13 e.v. were determined using probe measurements. Spatial electron density distribution and plasma temp. profiles along the plasma cloud volume, were obtained for different incident laser energies. Ion expansion velocities up to 100 km/sec. were observed using time flight measurements at different, spatial distances form the target surface. The data about the plasma parameters obtained are found to be compatible with his predictions of the Self-regulating Model, characterised by a thin thermal conduction zone.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **II-S-6, Sun. 27, 14:15**

High Intensity Lasers and Physics

Henry C. Kapteyn and
Margaret M. Murnane
Department of Physics,
Washington State University,
Pullman, WA 99164-2814

Abstract:

Summary: The extremely braod gain bandwidth of Ti:sapphire has made this material one of the most promising for the generation of ultrashort optical pulses. Recent advances in ultrashort-pulse Ti:sapphire lasers have made it possible to routinely genrate optical pulses of ~10 fs in duration, with nJ energies. 1-4 However, many applications of ultrashort pulses such as ultrablast x-ray generation, short-wavelength lasers, XUV harmonic genertion, and multi-photon ionization require higher energies, and therefore it is of great interest ot amplify the low energy pulses from the laser to higher enrgies, while maintaining their ultashort duration. The broad-bandwidth, ultrashort pulses from Ti:sapphire lasers can be used as low energy seed pulses for amplified based on the chirped-pulse amplification design. Although gain narrowing can limit the amplifed pulse bandwidth, our results demonstrate that it is possible to amplify 25 fs pulses to energies on order of tens of millijoules, and that further imporovements will be possible in the near future.

References:

1. D.E. Spence, P.N. Kean, W. Sibbett, Opt. Lett. 16, 42 (1991).
2. M.T. Asaki, C.P. Huang, D. Garvey, J. Zhou, H.C. Kapteyn, M.M. Muranane, Optics Letters 18, 977 (1993).
3. J. Zhou G. Taft, C.P. Huang, M.M. Muranane, H.C. Kapteyn, I. Christov, submitted to Optics Letters, (1994).
4. H.C. Kateyn, M.M. Murnane, in Optics and Photonics News, March 1994.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-7, Sun. 27, 14:45**

Laser Induced Flurorescenece Experiments in the Vacuum Ultrviolet

P. Bogen und Ph. Mertens.
Institute fur Plasmaphysik,
Forschungszentrum Julich
GmbH, Asociation
EURATOM-KFA,
52425 Julich, Germany.

Abstract:

Summary: The dectection of low densities of atoms (10^6-10^{13} atoms/cm^3) and of their velocity distributions is of high importane in many fiedls of research (e.g. gas discharges, high energy ion sputtering, fusion research, flames). for the investigation of plasma-wall interaction, the application to light elements is of main interest. Unfortuantely, the most important elements e.g. hydrogen (λ = 1215^o A), oxygen (1302 ^{o}A) and carbon (1277 ^{o}A, 1656 ^{o}A) have their resonance linss in the vacuum UV, where tunable lasers are not directly available. But dye lasers ca be upconverted to this wavelength range by non-linear processes.

Frequency tripling in noble gases as well as stimulated anti-Stokes Raman scattering in H_2 has been proved to be useful for this purpose. An excimer (500 m joule) pumped dye laser (40 mJ, 3 MWatt) at 3647 ^{o}A has been used to produce in a phase matched krypton/argon mixture up to 200 watt of L_α-radiation for 4 ns, which allowed the detection of H-atoms at densities below 10^7 /cm^3 . For the detection of carbon atoms (1277 ^{o}A), the dye laser was frequency tripled in a Xe/Ar mixture.

In the wavelenth range form the visible down to about 1140 ^{o}A, any wavelength can be produd by Raman shifting in H2 e.g, for L_α line Raman steps (each 4155 cm^{-1}) are needed to come from the 2226 A frequency doubled laser to the desired 1215 ^{o}A radiation. Compared to frequency tripling, the VUV-powr obtained is about the same or, at the low Raman orders, even much higher than in the case of frequency tripling, but the reproducibility is somewhat worse.

Applications of the laser indued fluorescence will be shown, i.e. the measurement of velocity distriubions of atoms sputtered from C, O, H-containing targets by an ion beam and of the H-atoms in the tokamak boundary palasma.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-9, Mon. 28, 9:00**

Lasers in Chemistry and Chemistry in Lasers Breaking Bonds to Order

Jai P. Mittal
Chemistry Group
Bhabha Atomic
Research Centre.
Trombay, Bombay,400 085,
India.

Abstract:

Summary: Skilled blending of the accumulated wisdom about electronic and vibrational excited states with new tools such as lasers and High Energy accelerators has opened new avenues of using photons as versatile chemical reagents to crack moleucles to order and produce new chemistry. The advent of high jintra-red laser has given birth to a new chemistry "vibrational photochemistry". One of the exciting features of this is isotope selectivity. This selective photochemistry has opened up new possibilities of probing molecular dissociation, isomerisation and finally raised hopes (!) of bond selective chemistry. Examples will also be given where the input of laser photons have opened new economically viable routes for the ultrapurification of electronic materials and newer routes for the production of some very high value products. Excitement of participation in this Laser Alchemy (?) be shared.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-10, Mon. 28, 9:30**

Laser Studies of Reactive Collisions

J. Christopher Whitehead.
Department of Chemistry,
University of Machester,
Manchester, M13 9PL,
U.K.

Abstract: The use of lasers has enabled the dynamics of chemical reactions to be studied at the most basic level where lasers can be used to prepare specific, well characteriized reagents and to probe the final states of the reaction products obtaining information on the scalar and vector properties of the reaction products. Various methods can be used to initiate chemical reactions and allow the time evolution of the reaction to be probed and information about the transition state to be obtained.

Summary: The history of the application of lasers to the study of chemical reactions over the last thirtyyears will be reviwed. Particular emphais will be placed on experiments that produce information about the dynamics rather than the kinetics of the reactions. Laser techniques that probe th final states of the reaction products by absorption, fluorescence and ionization can be used to determine the internal (vibrational, rotational and fine structure) product state distributions. Meaurement of the polarization, alignment and Doppler profiles can give inforamtion about the stereochemical aspects of the reaction dynamics. Laser can also be used to prepare reactive species such as electronically excited atoms and molecules, vibgrationally excited species or unstable free radicals. Lasers may also be used to initiate a chemical reaction to provide inforamtion on the time evolution of the reaction including the nature of the transition state. Examples will be selected from the author's laboratory and the work of others to demonstate the latest range of experiements.

References:

Dr. Whitehead was an undergrauate at Edinburgh and a postgraduate at Cambridge. He joined the chemistry Department at Manchester in 1977. He has studied chemical reactions and phtodissociation processes using molecualr beam and laser methods.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-11, Mon. 28, 10:00**

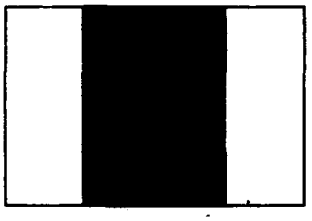
High Resolution Molecular Laser Applications in External Fields

W. Huttner,
Universitat Ulm,
bteilung Chemische Physik
D-89069 Germany.

Abstract:

Summary: Electric and magnetic properties like first nd higher order susceptibilties and polarizabilities are of general importance for molecular physics and non-linear optics. They may serve to characterize the free molecule but are also the basis for investigating alterations caused by intermolecular interactions in the condensed phases.
Because of their tensor character these quanitities must be determined in defined rovibronic quantum states or under similar conditions of known orientation. It will be shown that microwave optical double resonance (MODR) in external fields and electric and magnetic field induced birefringence are suitable methods for obtaining interesting results.

References:



Professor Dr. W. Huttner is the head of the laser group at the chemical physics Dept. of Ulm University.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-12, Mon. 28, 10:30**

Photoinitiators for Polymerization Reactions

Ideisan Ibrahim Abu-Abdoun
King Fahd University of
Petroleum and Minerals,
Chemistry Department -
Daharan 31261
Saudi Arabia

Abstract: Phenacyltriphenyl phosphonium, phenacyltriphenyl arosnium and p-methoxy tritylsalt having anions such as SbF_6^-, PF_6^- are useful photoinitiators for cationic polymerization of cyclohexene oxide, styrene and p-methyl styrene. Photosensitization enhances the rate of polymerization by these salts. Photodecompositon of aromatic carbonyl perseters based on benzophenone, pyrene, fluorenone, and anthrancene, gives a radical that can initiate the free radical polymerization of methyl methacrylate and styrene.

Experimental results are presented comapring the thermal stability and the efficiency of these compounds as photo or thermal initiators. The effects of initiator structure, photolysis time and phtosensitizer type on the rate of polymerization will be discussed. A possible mechanism of polymerization reaction by some of these initiators will be discussed.

Summary:

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-S-8, Mon. 28, 11:00**

NonLinear Effect for Solute-Solvent Interaction in Aqueous Solutions

Z. Blaszczak
Quantum Electronics Laboratory,
Institute of Physics,
A. Mickiewicz University,
Grunwaldzka 6, 6-0-780
Poznan, Poland.
M. Farhoud
Physics Dept., Faculty of Science,
P.O. Box 21511, Alexandria, Egypt.

Abstract: Solute-solved interactions wre studied by laser indued birefringence meausremtns in aqueous solutions of methanol, ethanol, propanol and acetone the data are combined with density and refractive index to calculate the optical and speci-fic kerr constants. From these data, the anisotropic factors, orientation parameter and orientation function could be calculated.

Summary: Optical birefringence (high frequency Kerr effect) takes place when a strong laser beam interacts with a medium. This effect which is also called optical Kerr effect (OKE), has been the subject of numerous theorectical and experimental studies in nanosecond time domains. Interest has been given to the concentration and temperature dependence of the optical Kerr effect. Additional information about the local structure of the molecules could be derived from them as well. To the best of our knowledge, this is the first report for the study of the concentration and temperature dependence of optically induced birefringence for aqueous solution of methanol, ethanol, propanol and acetone. Optical Kerr constnt (B_{Ω}), which describes the microscopic properties of the medium is considered as a very sensitive indicator of molecular association in liquid and solution, known for many pure liquids, while the properties of liquid mixtures have been investigated by many groups by measuring electric Kerr constant for several binary liquid mixtrues.

This work presents some measuements for the optical Kerr constant of binary liquid mixtures of aqueous solutions of methanol, ethanol, propaneol and acetone at wavelength 448.0 nm in a wide range of conentratin. At 50% concentatin the temperature dependence is measured in the interval from 283K to 315 K. From these data, the specific Kerr constant, anisotropic factor, optical anisotropy, oreitnation function and orientation parameter were calculated.

OKE was induced with the beam of a ruby laser (λ_i=694.3 nm, τ=10 ns, power density 20 MW/cm^2) and analysed with a continuosuly operating argon laser beam (λ_{α}=448.0 nm, power 100 mW). The principle and details of the setup were published elsewhere.

OKE measurements were performed for double-distilled water as a refernce liquid for the investigated molecular liquids. First, at room temperature, the optical Kerr constant (B_{rel}) was determined relative to water. Then, OKE was measured as a function of concentration and temperaure of 50% aqueous solution. The value of (B_{rel}) for each point, as caluclated by the least-squares method, is the statistical mean of thirty measurements. The calculated error in determination of the vlaues of (B_{rel}) was less than ·3%.

References:
1. D.G. Tyson and B.R. Jennings, J. Phys. D: Appl. Phys. 24, 645-653 (1991).
2. Z. Blaszckzak and . Farhoud, Laser Study of Macroscopic Biosystems, SPIE Vol. 1922, Jyvaskyla, Fainland (1992).
3. R.Piazza, V.Degiorgio and T. Bellini, Journal of the Optical Society of America B., Vol. 3, 1642. (1986).

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-13, Mon. 28, 14:00**

Evolution and Dynamics of the Laser Ablated Plume

Aldo Mele'
Departimento di Chimica
Universita "La Sapienza"
P.le A. Moro, 5-Roma, Italy.

Abstract:

Summary: The formation, composition and propagation of pulsed laser produced plasma plume from AIN and other solid targets have been studied by an image-intensified ICCD camera. Saptially and temporally high resolution optical spectroscopy and fast ICCD photography of plume has been monitored in real time. Velocities of ground state species and ionic species have been measured by their time of arrival from the target to a quadrupole mass spectrometer. The ICCD detection of the plasma expansion as a function of time is described by two dimensional (Y,Z) imaging contours in a low pressure range. In the presence of a background buffer gas the formation of shock structures are observed. In the first case the data fit a normal gas dynamic expansion regime in three directions. At high pressure (50-200 mTorr) the plume expansion is slower than in vacuum and there is evidence of chemcial reactions with the background gas. These resuls are relevant to thin film growth by pulsed-laser depositon .
10% imaging contours of AIN plume obtained by ICCD camera at 1, 26, 200 mt pressure of N_2 buffer gas at 800 ns delay are displayed.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-S-9, Mon., 28, 15:10**

Studies on the Optical Properties of Some Coumarines As Laser Dyes.

Lotfia El-Nadi
Maram Taha Hussine
National Institute of Laser
Enahanced Sciences.
Mohamed H. El-Nagdi
Department of Chemistry
Faculty of Sciencen & NILES
Cairo University.

Abstract: we attempt to develop new inexpensive cumarine laser dyes. Dibenzopyrans can also be laser dyes as they have structural features which is the same as that of comarine. The potential proprties of several dibenzopyrans have been investigated. Results will be discused.

Summary: Trials to develp new inexpensive cumarine lser dyes were made. It is well known that coumaines 1 ($x=NR_2$) are laser dyes and give emmission in the green band of the spectrum. These dyes however are: (i) Very expensive to prepare. (ii) Unstable in basic media. (iii) Emits only in somewhat narrow range of the spectrum.
Firstly we thought that the dibenzopyrans (2) would also be laser dyes as they have structural features which is the same as that of . These were pepared in our laboratories via a news route constituting of reacting 3 with 4 to yield 2. However, optical properties of these molecules were found to be much inferior to the know coumarine laser dyes. For this reason we have decided to imitate nature by keeping the amino of hydroxysubstitute at couimarin C-7, but increase the specturm of the dye and also improve stability of the formed laser dye by introducing heterocyclic substituent at C-3. Drexahauge has reported similar characteristics for 5. The opticl properties of these compunds is now under investigation. There is now prelimianry data that indicate that two of these would have characteristics, almost similar, to caumarin 120 with better stability in alkaline media and wider emission rangee which is sensitive to pH, values of the solution.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-18, Tue. 29, 10:30**

Studies on the Optical Properties of Some Coumarins as Laser Dyes

Lotfia El Nadi
Maram Taha Hussine
Natoinal institute of
Laser Enhanced Sciences
Mohamed H. El Nagdi
Dept. of Chemistry
Faculty of Science
Cairo University.

Abstract: We could develop new inexpensive coumarine laser dyes. Dibenzopyrans can also be laser dyes as they have structural features which is the same as that of comarine. The potential properties of several Dibenzopyrans has been investigated. Results will be discussed.

Summary: Trials to develop new inexpensive coumarin laser dyes were made. It is well known that some coumarin derivatives are laser dyes and give emission in the green band of the spectrum. These dyes however are very expensive to prepare, unstable in basic media and emits only in some what narrow range of the spectrum.
We thought that the Dibenzopyrans would also be laser dyes as they have structural features which is the same as that of coumarin these were prepared in our laboratories via a new route.
However, optical properties of these molecules were found to be much inferior to known coumarin laser dyes. For this reason we have decided t imitate nature by keeping the amino of hiphoxy substitute of coumarin C7 increase the spectrum of the dye and also improve stability of the formed laser dye by introducing hetrocyclic moieties were introduced on C3 of 7-hydroxy and 7-amino coumarins so much better optical properties were observed for these new dyes.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-S-10, Mon. 28, 15:20**

Measurements; the Physical Properties of cyclohexane using laser interferometric technique

G.E. Hassan
H. El Kashef
B. El Bradey
M. El Labban
Physics Dept.
Faculty of Science,
Tanta University.

Abstract: A laser Mach-Zehnder interfermoetric modifed technique provide the necessary high precision measurements of the physical properties of the most frequently used solvents for laser dyes is applied. This technique offer several advantages in determination of the absolute value of refractive index of cyclohexane at 20 C for a wavelength 632.8 nm and also its thermal coefficient. About fourteen various macroscopic and microscopic physical constants that can be derived from the refractive index are presented. In comparison with the other methods described in the literature, the accuracy and sensitivity of this technique are discussed.

Summary: Prepared laser dye solutions usually contain very small quantities of dye.Typical dye concentation are 10^{-2} - 10^{-5}. For this reason, the solvent in which the dye is dissolved pays a major role when defining physical properties and potential hazards. For the importance of cyclohexane as a solvent of about eight laser dyes, we report new measurements for its physical properties. A Mach-Zahnder optical system was described in [1] consists of three sections: optical, mechanical and the fringe reading recording system. The refractive index and its thermal coefficient can be determined by experiemental verificatin of a new Mach-Zehnder interfermoetric relation In comparison with the other methods described in the literature [2-3] accuracy of 0.00001 in the measuremtn of refractive index is achieved. On the other hand the error of the refractive index caused by the temperature fluctuations is 6.3×10^{-5}. Using Maxwell, Lorentz-Lorenz, and Debye equations [4] the following physical constants could be graphically represented or calculated. The results shows agreement with that extracted from the literature.

References:
1. H. El-Kashef: Review of Scientific Instruments, in press.
2. J.E. Allnutt, and J.A. Staniforth: J. Phys. E., Vol 4, 730 (1971).
3. Helene E. de Bruitjn, Rabp. H. Kooyman, and Jan Greve: Appl. Opt., Vol. 29, No. 13, 1974 (1990).

Physics Department, Faculty of Science, Tanta University, Tanta, Egypt. Professor Galal Hassan, the Chairman of Physics Dept. for several years, is establishing an active school in optics and laser applications.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-S-11, Mon. 28, 15:30**

Synthesis of New Heterocyclic Coumarine Derivatives as Laser Dyes.

Essam Hassan
Kawther Kassab
National Institute of Laser Enhanced Sciences.
Mohamed H., El-Nagdi
Ebtisam A. Hafez
Department of Chemistry.
Faculty of Science,
Cairo University.

Abstract: Since it has been reported that heterocyclic moiety at coumarine C_3 enhances its activity as laser dyes we have prepared several new such derivatives and defined their optical properties.

Summary: We are now building a reactor that wold allow investigation of the reactivity of second excited states photochemistry, literature is enormous but most of reported photo reactions occurs through etiher formation of radicals or through first excited states. We plane to synthesis new heterocycles as potential pharmaceuticals through this work but we believe that work in this direction will improve knowledge of basic phtochemical behaviour of molecules we are going to investigate.
The photo isomerisation of subsituted heteroaromatics which is well known to occur through either a biradicals or through first exited states will be reinvestigatd, new heterocycles of potenatil pharmaceutical activity would be formed.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S, Tue. 29, 9:00**

Present status of X-UV lasers: New Lasing Lines, Toward "Table Top" System

P.Dhez
Batiment 350, Centre d'Orsay
91405 ORSAY Cedex-France
Tel: 33 (1) 69.41.75 52
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Abstract:

Summary: First X-UV population inversions have been demonstrated about 20 years ago on a laser produced plama media.
Advantages and limits of the two main atomic processes able to achieve X-UV amplifying media are now well established. Large gain factor, saturated emission, coherence and polarization have been recently demonstrated on laser working near 20 nm.
Present research efforts are mainly devoted to target easy to handle, providing atomic transitions not too sensitive to plasma inhomogeneties and reachable with a minimum pumping laser energy.
X-UV multilayered mirrors are the key element to build optical cavity sustaining harsh plasma environment and providing good coupling between the amplified beam and the amplifying plasma.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-16, Tue.29, 9:30**

New Opportunities in Infrared Laser Spectroscopy

F. K. Tittle
Dept of Electrical and
Computer Engineering.
Rice University, P.O.Box 1892,
Houston, Texas 77251
Tel.: (713) 527-4833

Abstract: The development of novel compact tunable infrared laser sources based on difference frequency mixing of tunable lasers in AgGaS2 and their applications to high resolution molecular spectroscopy and remote sensing will be discussed.

Summary: Recent advances in the development of non-linear optical materials, such as AgGaS2 and AgGaSe2, now offer a convenient technique of generating cw tunable infrared narrow-band coherent radiation over a wide wavelength range (3 to 18 mm) by means of difference frequency generation (DFG) at room temperature. The use of tunable single frequency solid state lasers and semiconductor diode lasers as pump sources in the non-linear DFG mixing process is particularly attractive, as their compact size and ease of operation allow the construction of a portable and robust mid-infrared laser source especially suitable for environmental remote sensing, pollution detection, chemical analysis, and medical research. Recent progress towards the development of such a compact diode-laser based widely tunable cw DFG source with AgGaS2 as the non-linear optical material will be emphasised.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-18, Tue. 29, 10:30**

Prospects of Laser Sciences at the University of Qatar

Latifa Al-Houty
Physics Department,
University of Qatar,
PO Box 2713, Doha,
Qatar.

Abstract: The state of Qatar has limited human resources. There is only one institute of University education. The University of Qatar, being that institute, is then the only establishement that deals with knowledge, transmits it, enriches it through research and utilizes it in community services and social needs. The size of the University, however, limits its ability to expand and develop research in a vast range of fields. Hence, selection of specific priority research areas is a must. Care in identifying these areas should be considered in view of the social needs and the human and physical resources of the University.

Summary: In this paper, a brief overview of the University of Qatar is presented, and the Physics Department will be focused on. The development of the Department is outlind. It includes the Department's structure, facilities and current research areas. Identification of future areas of interest is discussed. Laser physics and its applications is one of the priorityfields in the Department. To introduce such a field, meetings, workshops, visiting experts, recuruitment of specialist staff, and other related activities were carried out. The main objectives of these activities is to motivate students in laser sciences, initiate awareness of the importance of laser applications, identify interested personnel within, and outside, the University, and to build up a reasonable core in order to launch this important field. Also, the Department's efforts in introducing special courses and establishing related laboratories are outlined. Problems and constraints, as well as some recommendations, are addressed.

References:

Dr. Lotfia Al-Houty is the Professor of Physics and head of the physics Dept. at Qatar University, she has MSc. of University of Colorado Baulder (1971), the Ph.D. degree of Ain Shams University, 1979. She is the pioneer physists in Qatar.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-S-11, Mon. 28, 15:30**

Synthesis of New Coumarin Azoles of Promising Lasing Properties

Kawser N. Kassab
Essam M. Hassan
National Institute of Laser enhanced sciences.
Mohamed H. Elnagdi
Ebtesam A. Hafez
Dept. of Chemistry
Faculty of Science
Cairo University

Abstract: Since it has been reported that heterocyclic moiety at coumarin C3 enhances its activity as laser dyes we have prepared new coumarin azoles of promising optical and photochemical properties.

Summary: Coumarins with hydroxy substitutent at C7 has been utilised as laser dyes that emit strongly in the green-blue of the spectrum. One drawback was its instability as a lasing media. Drexhauge has reported that coumarin stability and tunability is greatly improved on introducing heterocycles at C3. It seemed to us that coumarinyl azoles having structural features similar to well established coumarin laser dyes are attracting targets to synthesis and investigate their photochemical and lasing properties in different solvents and different PH.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-19, Tue. 29, 14:15**

Comparative Spectral Response of Photothermal Deflection and Photoacoustic Techniques

Sohair Negm
Faculty of Engineering
(Shobra), Zagazig University
Benha, Cairo, Egypt.

Abstract: The fact that phototehermal defelection PD techniques as superior to phtoaoustic PA techniques in measuremnt requiring spectral resolutin has been applied extensively in the literature [1]. In this paper we report on an additional capability for the PD technique concerning spectral resoltuion. We have carried out a comparative experiemental study of the PD and PA spectrospcopies for Carbon black under the same spectroscopic parameters; scan speed of the pump beam and slit width of the monochromator, to investigate the spectral response of the two techniques. Towards this end, we have employed the whole radiation from an Argon laser using the mirror arrangement to produce all the lines. We show the PA saturation spectra and the corresponding PD spectra (clearly indicating the sharp lines of Argon). the PD spectra was taken at a normal offset Z0=85 μm. As the distance Zo is increased the PD spectra loses its defiintin of the sharp line and approaches the same structur of the PA spectra. In a separate experiment we used the pump beam incident from a Tungestin lamp on a crystal violet (CV) sample which is caharacterized by two adjacent abosrption bands at 550 nm and 580 nm. The PA spectra for V is giving an envolope spectra and the corresponding PD spectra show clearly that the two spectra are a result of the difference in the detection method of the two techniques. In PA, the microphone detects an acoustic wave that seems to avarage over these separate peaks where as in the PD techniques the deflection of the probe beam can clearly resolve these two peaks at close offset distances. This spectral resolutin capbility adds to the advantages of PD techniques in comparison with PA techniques. We are developing a model for the PD detection that would campass the dependence of the spectral resolution on the thermal wave as well as the spectral scan speed and the offset distance Zo.

Summary:

References:
1. Nabil M. Amer, Andrew Skumanich, and Dean Ripple, App. Phys. Lett., 49, 137 (1986).

Dr. Sohair Negm is an associate professor at the physics and Math. Dept. of the Faculty of Engineering Zagazig University. She is an active member of the laser laboratory at Ain Shams University.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-20, Tue. 29, 14:45**

Novel Nitrogen Laser in Ring Cavity

Lotfi Z. Ismail
Physics Department,
Faculty of Science,
University of Qatar,
P.O.Box 2713, Doha,
Qatar.

Abstract: New configuration is proposed and constructed for amplification and reshaping of nitrogen laser pulses. The method is based on a ring cavity containing the oscillator stage and the amplifier stage. The amplifier stage produces both the gain amplification and the phase nonlinearity required for laser pulse reshaping. It is expected that this system will increase the laser conversion efficiency by a factor of 20%.

Summary: Nitrogen laser has numerous important appliacations in laser induced fluorescence spectroscopy. This laser type is widely used as a pumping source in a variety of schemes to produce subnanosecond tunable dye laser pulses covering the visible wavelength range.
Some applications require short pulses of intense coherent radiation that could be produced by applying the well-established techniques known as fiber-prism and fiber-grating systems. Also, a dispersion prism system is recommended for laser compression. On the othe hand, nonlinear interferometric devices (ring resonators) are suggested for pulse compression and for optical bistability configuration.
This paper proposes a ring resonator (RR) containing two laser systems in order to improve the laser efficiency and reshape signal profile. These properties are induced due to the nonlinear phase shift produced by the discharge current variation with time throughout the laser pulse inducing a profile reshape. At each round trip, the amplified laser pulse is interferometrically recombined at the beam splitter. This interferometric recombination produces an effective temporal modulation on the time scale of the circulating pulse. A system made up of two nitrogen laser heads inserted in a ring cavity is proposed. According to our knowledge, such configuration is proposed for the first time. Also, the characteristics for the two nitrogen stages are discussed as well as the coupled operation. It is expected that this system will increase the laser conversion efficiency by 20%.

References:

Dr. Lotfi Z. Ismail is professor of experimental physics at the physics dept. Cairo University and a member of NILES. He has BSc. 1971, Ph.D. Moscow University 1978, full prof. 1993. He is on leave at Qatar University since 1991 up till now.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-S-21, Tue. 29, 15:15**

Diode-Pumped Solid-State Lasers Operating at Low Amplitude and Frequency Noise

H. Welling
Laser Zentrum Hannover e.V.,
Hollerithallee 8, D-30149
Hannover, Germany.
Tel. : (49) 511 2788 110,
Fax : (49) 511 2788 100

Abstract:

Summary: One of the greater challenges in science is the experimental proof of gravitational waves. For Michelson type interferometric detector systems a light source with high continuous wave output power in single-frequency operation, excellent frequency stability and extremely low amplitude noise close to the quantum limit is essential. Diode-pumped solid-state lasers are well knwon as compact, reliable and highly efficient sources of stable radiation for highly resolution spectroscopy and interferometer based metrology Based on a diode-pumped Nd: YAG miniature ring laser a light source has been developed that has the potential to meet these requirements. This contribution reports on the substantial progress in the properties of this light source.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **IL-S-23, Wed. 30, 9:30**

Determination of Level Population from Dispersion Measurements in Doublet-Line Wings.

M. A. Khashan,
A.Y. Nassif
M.M. Anwar
Physics Dept.,
Faculty of Science,
Ain Shams Uni.
Cairo, Egypt.

Abstract: A double layer interferometer followed by a moderate auxiliary dispersion is used to observe the perturbatin in the vicinity of the absorption line of Na-atoms. The perturbation is measured so as to construct the dispersion curve and to determine level population.

Summary: A modified Sellmeier dispersion formula is derived to account for the chromatic birefringeence in the wings of a doublet line with overlapped fine structure components. This dispersion function is found to depend on the component separation and their oscillator strengths. A double layer interferometer containing flame-excited atomic sodium vapors irradiated by a continuous spectrum source was used. Light transmitted by the interferometer is resolved by a moderate-resolution prism spectrograph where a set of concentric rings of equal chromatic order (RECO) replaces the continuous spectrum of the background source. The ellipitc RECOs are petrutbed as they crossed by the abosrption sodium D-line. The RECO perturbation is measured so as to construct the dispersion curve on both sides of the absorption line. The obtained results are fitted to Sellmeier hyperbolic function to deduce the level population due to the flame exictation of the sodium atoms.

References:
1. Huber M. C. and Sandeman R.J. Rep. Prog. Phys. 49 (1986) 397-490.
2. Khashan. M.A. and Nassif A.Y. Physics 124 C (1984) 114-127
3. Marlow W.C. Appl. Optic 6 (1967) 1715.

M.A. Kahsan
Professor of Optics & Sepectroscopy, Ain Shams University.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-S-14, Wed. 30, 10:00**

Quantum Statisitics of a 3-Level Atom + Multiphoton Two-Mode Field (1) Photon bunching & Antibunching

A.R.A., El-Samman
Department of Mathematics,
Faculty of Science,
Al-Azhar University, Nasr City,
Cairo, Egypt.

Abstract: The statistics of a three-level atom interacting with a two-mode and multiphoton electomagnetic field is treated, photon distribution probability function is obtained for differnet situations where the atomic systems initially in its ground, intermediate and excited state, where the interacting field is assumed initially in its choherent state. The bunching and antibunching phenomenae being studied via the second-order correlation function. While the correlations between the field modes is measured by the cross correlation function.

Summary:

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **PL-2, Mon.29, 1330**

Micro-arc Plasma Diagnostic using Photo-Deflection System

M. Atta
M.M. Omar
NILES,
Cairo University.

Abstract: Photo deflection technique has been used for sensing an discriminating between electrons and neutral particles in a multi component Micro-arc plasma with short arc duration (1 μs-10 μs), high voltage 30 kv and arc current (80-260 A) under high vacuum, plasma produced due to the discharge between the target as a graphite disk cathode and pin tungsten anode. The velocities of the electrons and neutral particles has been determined by using photo deflection technique, the results were compared with the other methods.

Summary: Bochum, Germany Investigation of the time evolution of the plasma produced by Micro arc discharge on graphite cathode has been measured by measuring the deflection of a laser beam after penetrating the plasma. The He-Ne laser beam was parallel to the graphite cathode and far by 7 mm from the cathode centr and detected by a photo diode array at 2 m from the center of the normal of the graphite cathode. The electrical circuit and electrode system has been described by (2) the expansion velocity for each species can be determined by using Eq. (8), (11), (12) by (1). One sees that the initial plasma peak is coming before the neutral peak and that the plasma velocities is significantly higher than the neutral velocity.
One founds that the characteristics velocities of plasma 0.4 cm/μs and the neutral are 0.03 cm/s. These data are consistent with Faraday cup measurements of charged particles.

References:
1. C.L. Enlo et al, Rev. Sci. Instrum. P. 1597-1600, Vol., 58, No. 9, September 1987.
2. Matte et al., XXI st International Conference on Phenomena in ionised gases, 1993.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-S-16, Wed. 30, 10:30**

Study of Laser Modes Using Optical Analyzer

Afaf A. Gadalla
Physics Dept.,
Faculty of Scienece
Assiut Uni,
Assiut.

Abstract:

Summary: The output frequency spreads of most types of laser are very much less than those from more conventional sources, such as filament lamps. This means, for example, that lasers are excellent light sources in interference experiments or holography. However, although they are narrow, laser output bandwidths are not zero. In many cases - the laboratory He-Ne laser is a good example - the output actually consists of a number of closely spaced individual frequencies or "modes". Under some conditions the fraction of each mode contributing to the total output can vary, giving rise to intensity and polarisation changes in the laser beam.
It is common areas of modern metrology in which lasers are used, to need to know the quality of the mode structure of the output. In this experiment you will use a commercial "optical spectrum analyser" to examine the mode structures of two He-Ne lasers. The results provide information on some of the fundamentals of laser action and give insight into the operation of the Fabry-Perot Interferometer which lies at the heart of the optical spectrum analyser.

References:

V- CONFERENCE [illegible] (Location Room 3 OLC)

Programme Chair: David Gartry, Moorfield Eye hospital, Institute of Ophthalmology, London (UK).
Programme Committee: Sayed SAIF, Moushera S. ELDEAN, Shoukery HUNTER, Nadia SALEH

SATURDAY MARCH 26, 1994

Session 1 (SEE PLENARY SESSION LECTURES) 13:30-14:00

TEA BREAK (Location cafeteria of OLC 3rd floor) 14:00-4:15

Session 2 (Afternoon) 14:15-15:45

Theme chairs: **Tarek Abbas, Hatem Abdulrahman**

IL-M-1 **Mohamed Sharawy**, Medical College of Gorgia (USA) 14:15-14:35
Experimental Approach to the Study of Laser Application in Dentistry.

IL-M-2 **Harvey Wigdor**, Ravenswood Hospital Medical Center of Chicago (USA) 14:35-15:45
Laser in Dentistry.

IL-M-3 **Tatjana Dostalova**, Institue of Dental Research (CZECH) 14:15-15:15
The Principle of Noninvasive Ablation with Er: YAG laser in Dentistry

OP-M-1 **M.S.EL ATTAR**, Faculty of Dentistry, Alexandria University (EGYPT) 15:15-15:25
Evaluation of the effect of using soft Laser on Osseointegration of Blade implants.

OP-M-2 **Mokhtar Abdulatif**, Faculty of Dentistry, Cairo Univ. (EGYPT) 15:25-15:35
CO2 Laser in Dentistry.

OP-M-3 **Moushira S. Eldean**, Faculty of Dentistry & NILES 15:35-15:45
Future Applications of Lasers in Dentistry Cairo Univ.

Soft Drink Break (location cafetrria OLC third floor) 15:45-16:00

Session 3 (See TUTORAIAL SEMINARS) 16:00-17:30

SUNDAY MARCH 27, 1994

Sessio 4 (Morning) 9:00-11:15

Theme chairs: **David Gartry, Abdel Latif Siam, Sayed Saif.**

IL-M-4 **David Gartry**, Moorfield Hosptial, Institute of 9:00-9:30
Ophthalmology, London (UK)
Eximer Laser Photorefractive Keratactomy for Moyopia, is it Really the Bottom Line?

IL-M-5 **Abdel Latif Siam**, Faculty of Medicine, Ain Shams Univ. (EGYPT) 9:30-9:50
Ophthalmic Appliations of Modern Diode Lasers.

IL-M-6 **Medhat El Hennawi**, Faculty of Medicine, Alexandria Univ. (EGYPT) 9:50-10:10
Endoscopic Laser Surgery

OP-M-4 **Sayed Saif**, Faculty of Medicine & NILES, Cairo Univ. (EGYPT) 10:10-10:30
Excimer Laser in Anisometropia.

IL-M-7 **Beshr Kenawy**, Faculty of Medicine, Cairo Univ. (EGYPT) 10:30-10:50
Excimer Photorefractive Keratactomy in Myopia.

OP-M-5 **G. El Mashad**, Zagazig University (EGYPT) 10:50-11:10

COFFET BREAK (Location Caferteria OLC 3rd floor) 11:15-11:30

Session 5 (SEE KEYNOTE LECTURES) 11:30-12:30

Quick Lunch & Exhibit (Location OLC & Univ. Guest House) 12:30-13:30

Session 6 (SEE PLENARY LECTURE) 13:30-14:00

TEA BREAK (Location cafeteria OLC 3rd floor) 14:00-14:15

Session 7 (Afternoon) 14:15-15:45

Theme Chairs: **Ionnis Pallikaris, Nabil Sabry, Sayed Saif.**

IL-M-8 **Ionnis Pallikaris**, University of Crete (GREECE) 14:15-14:45
New Laser Directions in Ophthalmology.

IL-M-9 **Nabil Sabry**, Faculty of Medicine, Alexandria Univ. (EGYPT) 14:45-15:00
New Ophthalmic Lasers.

IL-M-10 **Ahmed Barrada**, Faculty of Medicine, Alazhar Univ. (EGYPT) 15:00-15:15
Photorefractive keratactomy.

OP-M-6 **Sayed Saif**, Faculty of Medicine & NILES, Cairo Univ. (EGYPT) 15:15-15:25
Excimer Laser Phtorefractive Keratactomy

OP-M-7 **H. Hassanin**, Zagazig Univ. (EGYPT) 15:25-15:35
Argon Laser RIOR to Nd:YAG Iridectomy.

OP-M-8 **Zeinab El Senbary**, Cairo University (EGYPT) 15:35-15:45
Nd: YAG Laser in Cataract Surgery.

SOFT DRINK BREEK 15:45-16:00

Session 8 (SEE TUTORIAL SEMINAR) 16:00-17:30

MONDAY MARCH 28, 1994

Session 9 (Morning) 9:00-11:15

Theme Chairs: **Ahmed Shafik, Shoukry Hunter**

IL-M-11 **Ramashandra Dasari**, Massachustts Inst. of Tech. (USA) 9:00-9:30
Application of Lasers in Biomedicine.

IL-M-12 **Shoukry Hunter**, Faculty of Medicine, Cairo University (EGYPT) 9:30-10:00
The Use of Lasers in Oesohpagogastric Carcinoma.

IL-M-3 **Tayyba Hassan**, Harvard Univ. Medical School (USA) 10:00-10:20
Photochemical Targeting of Cancer Cells.

IL-M-14 **Amr Helmy**, Liver Institute Monofiya Univ. (EGYPT) 10:20-10:40
Liver Resection and Laser Hyper thermia.

OP-M-9 **Hisham El Gohary**, NILES, Cairo Univ. (EGYPT) 10:40-10:50
Biliary Laser Lithotripsy Using Q-switched
Nd:YAG Laser Combined Wavelengths.

OP-M-10 **Ahmed Bedair**, Cairo University (EGYPT) 10:50-11:05
Transuretheral Laser Prostatectomy

IL-M-15 **Essam Yacout El Sahwi**, Alexandria Univ. (EGYPT) 11:05-11:15
Lasers in Angiomas.

COFFEEE BREAK (Location cafeteria OLC 3rd floor) 11:15-11:30

Session 10 (SEE KEYNOTE LECTURES) 11:30-12:30

QUICK LUNCH & EXHIBIT (Location OLC & Univ. Guest House) 12:30-13:30

Session 11 (SEE PLENARY LECTURES) 13:30-14:00

TEA BREAK (Location Cafeteria OLC 3rd floor) **14:00-14:15**

Session 12 (Afternoon) **14:15-15:45**

Theme Chairs: **Karsten Koenig, Maged El Shannawy.**

IL-M-16 **Karsten Koenig,** University of California, Irvine (USA) 14:15-14:45
Laser Induced Auto fluorescence in Medical Diagnosis

IL-M-17 **Maged El Shennawy,** Faculty of Medicine, Cairo Univ. (EGYPT)
Lasers in Cancer Laryhx. 14:45-15:05

IL-M-18 **Katerina Svanberg,** Lund University (SWEDEN) 15:05-15:25
Tissue Diagnosis and PDT using Lasers.

IL-M-19 **Sune Svanberg,** Lund Technical Institute (SWEDEN) 15:25-15:40
Time Resolved Spectroscopic Technques in Laser Medicine.

OP-M-11 **Essam El Nezamy,** Cairo University (EGYPT) 15:40-15:50
Laser Recanalization of post corrosive stricture of the Oesophagus.

SOFT DRINK BREAK (Location Cafetria OLC 3rd floor) **15:45-16:00**

Session 13 (SEE TUTORIAL SEMINARS) **16:00-17:30**

TUESDAY MARCH 29, 1994

Session 14 (Morning) **09:00-11:15**

Theme Chairs: **U. Hohenleutner, M. Abdel Moniem, M. Nada.**

IL-M-20 **Hohenleutner,** University of Regensburg (GERMANY) 09:00-09:30
Laser in Dermatology.

IL-M-21 **Amal Kurban,** Boston University (USA) 09:30-10:00
An update of the use of Laser in Dematology.

IL-M-22 **M. Abdel Moneim,** Al-Azhar University (EGYPT) 10:00-10:30
Laser for Dermatologic Purposes.

IL-M-23 **Talal Abdel Rahim,** University of Regensburg (GERMANY) 10:30-11:00
Nd-YAG Laser for Verruca Vulgaris.

COFFEE BREAK (Location Cafeteria OLC 3rd floor) **11:15-11:30**

Session 15 (SEE KEYNOTE LECTURE) **11:30-12:30**

QUICK LUNCH & EXHIBIT (OLC cafeteria & Univ. Guest house) **12:30-13:30**

Session 16 (SEE PLENARY LECTURE) **13:30-14:00**

TEA BREAK (Location cafeteria OLC 3rd floor) **14:00-14:15.**

Session 17 (Afternoon) **14:15-15:45**

Theme Chairs: **Amal Kurban, Nadia Saleh.**

OP-M-12 **Amal Kurban,** Boston University (USA) 14:15-14:45
Laser treatment of cutaneous Malignancies.

OP-M-13 **Bakr El Zawahry,** Cairo University (EGYPT) 14:45-15:00
Argon Laser in Dermatology.

OP-M-14 **Talal Abdel Raheem,** University of Regensburg (GERMANY)
Complications of Flash Lamp Pulsed dye Laser. 15:00-15:15

OP-M-15 **Nadia Saleh,** Faculty of Medicine & NILES, Cairo Univ. (EGYPT) 15:15-15:30
Prospectives of Lasers in Dermatology.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **M-1, Sat. 26, 14:15**

Experimental Approach to Laser Application in Dentistry.

Mohamed Sharawy
Houssam Tewfik,
Medical College of Georgia,
Augusta, Georgia, U.S.A.

Abstract: This presentation will briefly discuss the biophysics of laser, the properties, advantages and disadvantages of the lasers available for dental and medical use and it will end by presenting our research on structural and functional changes in root and crown dentine and the biological effect of KTP laser on induced periodical lesions in ferrets.

Summary: Laser application in dentistry is gaining momentum since the development of new laser units that have delivery systems such as the hollow wave guide with sapphire tips used with CO2 laser and 100-600 micrometers fiberoptics used with KTP-lasers. The lasers are now approved of soft tissue applications and have been used extensively in surgical ablation of tumours, frenectomy, ginglovplasty, tuberosity reduction, flat leukoplakia, hemagiomas, port wine stains, etc. Research is being conducted at present, to expand the use of lasers on hard tissues such as enamel and dentine. Results are promising and it will allow the application of lasers to endodontics, removal of caries, cavity preparation and desensitization of dentine, etc. This presentation will briefly discuss some of our experimental approaches to the use of CO2 and KTP-532 lasers on dentine and periapical lesions.

References:

Dr. Mohamed Sharawy, B.D.S. in 1962, Ph.D. degree inAnatomical Sciences, University of Rochester, (Rochester, N.Y.) in 1970. He is currently Professor and Director of Anatomy in the Dept. of Oral Biology and Professor of Oral and Maxillofacial Surgery, Medical College of Georgia, Augusta, Georgia.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-M-2, Sat. 26, 14:35**

Lasers in Dentistry

Harvey Wigdor D.D.S., M.S.
Dental Section Chief.
Ravenswood Hospital Med Center
Chicago, Illinois 60640
U.S.A.

Abstract: Ever since the development of the ruby laser by Maiman there has been much interest in the possible use of lasers in dentistry. The use of lasers on dental soft tissues in the clinical setting will be presented. The potential for the use of the Er.: YAG laser to replace the dental drill will be discussed and the presentation of research investigating this laser for the ablation of dental hard tissues and material will be shown.

Summary: The use of the laser for dental treatment has been attractive to dentists ever since the development of the ruby laser by Maiman. The object of this paper is to report on the use of the CO2 laser for dental soft tissue surgery. Specifically the CO2 laser will be used to remove hyperplastic tissue, epulis fissuratum, dental implant retrieval and frenectomy. The dream of the present dental researchers is to find a method to replace the dental drill which is used routinely by dentists every day. The Er.: YAG laser has been studied and the results of these studies will be presented. The ablation rate and thermal effects of the Er.: YAG laser on dental hard tissues and materials will be presented. The effect of water on these materials will also be presented. It seems that the Er: YAG will cause a thermal event in a tooth that could be harmful. Of surprise was the finding that water reduced the efficiency of this laser on dental hard tissues only by about 10% and had very little effect on the dental materials studied.

References:
1. Widgor, H.A., Abt, E., Ashrafi, S., Walsh, J T.; The Effects of Lasers on Dental Hard Tissues, JADA, Vol. 124, 65-70, 1993.
2. Widgor, H.A., Walsh, J.T.Jr., Visuri, S.R., Thermal Effects of Er: YAG Laser on Dental Hard Tissues. Proceeedins of Dental Applications of Lasers SPIE Proceedings Vol. 2080 26-32, 1993.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-M-3, Sat. 26, 14:15**

The Principles of non-invasive ablation with Er: YAG Laser in Dentistry - Preclinical Study.

Tatjana Dostalova,
Krejsa.
Helena Jelinkova,
Karel Hamal
The institute of dental Research
Vinohradska 48,
120 60 Prague 2,
Czech Republic.

Abstract: The possiblity of the laser radiation in stomatology are discussed and analyzed. The most efficient wavelength for non-invasive treatment is mid-infrared Er: YAG radiatin. The principles of the ablation with Er: YAG laser in the dentistry were defined. The analyzing methods used were SEM, micrographs polarized light, electron microanalyser, computer monitoring of thermal effects and histology.

Summary: Solid state lasers are making possible technological rapid advance with the medical applications by virture of their wavelength and temporal mode versatility, convenience, and relative compactness and portability. The possibility of the laser radiation in stomatology are discussed and analyzed. The difference between these radiation influence is done by the abosrption of this radiation in the water. From this dependence it is evident that the abosorption peak coincidences with the wavelength of Er: YAG laser. This 2.966 μm wavelength of erbium doped YAG laser is abosrbed strongely by the water components of soft tissue, and by the water ,organic, and calcium phosphate components of hard, calcified tissue such as bone and teeth. The most efficient wavelength for non-invasive treatment is mid-infrared Er: YAG radiation. The principle of ablation with Er: YAG laser in dentistry was defined. Extracted non-carious permanent teeth were used for this study. The teeth were storred in 10% neutral formalin, cleaned and rinsed with water and immersed in cold distilled water. Prior the laser preparation the tooth were wiped clean with cellulose wool and allowed to dry in the air. Buccal surfaces (Class V) of the tooth surfaces were treated. Control group contained the micrographs of the intact teeth before the enamel and dentin ablation. The analyzing methods used were SEM, micrographs polarized light, electron microanalyzer, computer monitoring of thermal effects and histology.

References:

1. Burkes, E.J.: Hoke, J.; Gomes, E., and Wolbarsht, M. (1992): Wet versus Dry enamel Ablation by Er. : YAG Laser, J. Prosther Dent. 67; 847-851.
2. Gharber, D.A. (1992): Dental Lasers- MJyths, Magic, and Miracles? Part 1: Introduction to Lasers in dentistry, Compend Contin Educe Dent. 12; 448-454.
3. Midda, M. and Renton - Harper, P. (1991): Lasers in dentistry, Br Dent. J. 170; 343-346.

Dr. Tatjana Dostalova, M.D., Ph.D., was born on Oct. 21, 1955. She receivd diploma in medicine in 1979 obtained the first degree in dentistry in 1982. She attended for one year the necessary studies to obtain the degree M.Ms diploma 1989.
In 1993 she became head of clinical center Medical School Institute of Dental Resarch. She has published some 39 crilieal articles in dentistry.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **OP-M-1, Sat. 26, 15:15**

Evaluation of the effect of using soft laser on osseointegration of Blade implants.

M.S. **El Attar**
Prosthodontic Dept.
Faculty of Dentistry
Alexandria University.

Abstract: The effect of applying soft laser beams osseointegration of Blade dental implants inserted in experimental animals (dogs), was evaluated.
Soft Laser beam application following the insertion of blade implants was performed. A positive effect favouring implant site healing and bone growth was noticed.
Soft laser beam application is recommended to enhance osseointegration in early stages after implant insertion.

Summary:

References:

M.S. El Attar is associate professor at the
Prosthodontic Dept. Faculty of Dentistry, Alexandria University

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-M-3, Sat. 26, 15:25**

The Application of the CO2 Laser in Oral Surgery.

Mokhtar M. Abdulatif
Oral Surgery,
Faculty of Oral Medicine & Surgery,
Cairo University.

Abstract: Lasers which are considered the most recent treatment modality have still to prove their superiority over conventional treatment modalities.

Summary: The Co_2 laser was used to remove oral benign soft tissue tumours from thirty patients. The post-operative period was free from any morbidity (Pain, oedema, ... etc) by the end of the post-operative period no scarring or tissue contracture of the surgical sites was evident. Hence, the CO_2 laser was very successful in the removal of benign soft tissue tumours.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-M-3, Sat. 26, 10:35**

Effect of Nd: YAG Laser on Human Enamel and Dentine

Moushira Salah El Dean
Oral Radiology & NILES,
Faculty of Oral Medicine & Surgery,
Cairo University.

Abstract: A low-energy Nd: YAG laser was used to irradiate extracted human teeth in a study to determine the extent of the morphologic changes produced in the enamel and dentine surfaces.

Summary:

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **IL-M-5, Sun. 27, 09:30**

Ophthalmic Applications of Modern Diode Lasers

Abdel-Latif Siam.
Dept. of Ophtalmology
Faculty of Medicine,
Ain Shams University,
Cairo University.

Abstract: The physical basis and clinical applications of diode laser is presented. This infrared laser emitting at 810 nm has several advantages over other lasers and is most suited for developing countries due to its compact size, efficency, simple construction, long life, low cost, and easy maintenance. Diode lasers are particularly suitable for phototherapy of various macular pathologic conditions, vascular diseases, and intractable glaucoma. The multiple delivery systems and various applications are illustrated by a videotape.

Summary:

References:

Abdel Latif Siam Frcs, FRC Ophth.
Professor of Ophtalmology, Ain Shams University,
Cairo, Egypt.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **OP-M-4, Sun. 27, 10:10**

Excimer Laser in Myopic Anisometropia

Sayed S. E.H. Saif
Dept. of Ophthalmology,
Kaser Al Aini School of
Medicine, Cairo Uni.,
Giza, Egypt.

Abstract: Excimer laser is a new modality used in refractive surgery to correct myopia. It's use was subject to a great conflict, between the extreme with and the extreme against. But the use of this modality in Anisometropia due to myopia is an ideal indications, specially when it is associated with superficial conrneal opacity; in which case no other way could correct both deformities.
Twenty cases of anisometropia due to myopia associated with clear cornea or superficial corneal opacity are choosen for excimer treatment. The results were very much gratifying, and the full discussion of the cases will be presented; including the details of the technique, the complications and the outcome.

Summary:

References:

Sayed Saif: Professor of Ophthalmology, at the faculty of Medicine, Cairo University.
M.D., Professor Chair.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **OP-M-5, Sun. 27, 10:50**

Nd: Yag Laser as an Altenative Technique for Laser Trabeculoplasty

Dr. Sayed S. E.H. Saif.
Dr. Hossam Hassanin
Dr. Gamal El Mashad
Dept. of Opthalmology,
Kaser El-Aini School of Medicine, Cairo Uni., Giza, Egypt.

Abstract: We compared the effect of Yag laser Trabeculooplasty (YLT) and Argon laser trabeculoplasty (ALT) on intraocular pressure (IOP) and ocular inflammation. Twelve patients with uncontrolled open angle glaucoma: IOP 26 mmHg or more despite maximal tolerated medical therapy were treatd by ALT in one eye and YLT in the controlateral eye.

Summary:

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994

New Laser Directions in Ophthalimology

IL-M-8-, Sun. 27, 14:15

Ionnis G. Pallikaris, M.D.
University of Crete,
Medical School,
Dept. Ophthalmology,
Greece.

Abstract:

Summary: During the last decade, Ophthalmology has used all new generation lasers. The increased demand for Refractive surgery was the main reason for the use of infrared lasers. Research was then directed to other types of lasers that could also be used in refractive surgical procedures, mainly Holmium. As the interest of this field is huge, 35% of the population suffereing from various refractive errors, there is an intense activity by companies and research groups towards this direction, using entirely different laser delivery systems. There are intrastormal corneal tissue ablation, photorefractive keratectomy, a combination of surgical keratomileusis and laser for the correction of high myopia and Holmium laser that induces shrinkage of various types of collagen.An era of rapid evolution in Ophthalmology is that of photodynamic therapy, by using new photosensitive eyes and small diode lasers of short waves. The experience of the Univeristy of Crete consists of the laser use with phthalocyanine and a small diode laser fit to a slit lamp for the research needs.
During the last five years the University of Crete-through its cooperation with other centers in Europe and U.S.A. - has become a reference center in this field. The experience and research protocols of the University of Crete in relation to the new internationl directions of the respective fields will be presented during this work.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-M-9, Sun., 27, 14:45**

Modern Lasers in Glaucoma

Nabil Sabry, M.D.
Dept. of Ophthalmology,
University of Alexandria.

Abstract: Recently laser is considered an important tool in solving the problem of glaucoma. The principles, indications, the technique, the complication and the future laser therapy with the different modalities in controlling glaucoma will be presented.

Summary: Laser iridetomy has been acclaimed as a reveolutionary technique replacing the classic surgical iridectomy. We will therefore compare the relative merits and demerits of these two techniques. In practice, however, laser iriodotomy should always be the treatment of choice if it is technically feasable. LTP is considered as an alternative to a filteration operation in cases of gluacoma that have become unresponsive to medical therapy. The main target for LTP is primary open-angle glaucoma (POAG). Transscleral ciliary coagulation have been used after failure of medical therapy, laser therapy, and filtering procedures.

References:

1. Blandeau P., Roberge J.F., Asselin Y: Long term results of low power long duration laser trabeculoplasty. Am J. Ophthal. 104: 339-342, 1987.
2. Go F., Akiba Y., Yamamoto T et al.: Argon Laser iredotomy and surgical iredictomy in treatment of primary angle closure glaucoma. Jpn. J. Ophthal. 28:36-46, 1984.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **OP-M-6, Sun. 27, 15:15**

Excimer Phtotherapeutic Keratectomy

Sayed S.E.H. Saif
Dept. of Ophthalmology,
Faculty of Medecine,
Cairo University.

Abstract: The superficial corneal opacity of the cornea may affect the visual acuity markedly, sometimes more than a denser localised leucoma.
Escimer laser photokeratectomy is a magic procedure to get rid of the problem.
Ten cases were choosen, but when and how?.... will be discussed in full details, results, and the difficulties will be considered.

Summary:

References:

Prof. of Ophthalmology, Faculty of Medicine, Cairo University.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **OP-M-7, Sun. 27, 15:25**

Argon Laser Pretreatment prior to Nd: YAG Laser iridotomy

Dr. Sayed S. E.H. Saif.
Dr. Hossam Hassanin
Dr. Gamal El Mashad
Dept. of Ophthalmology,
Kaser El Aini School of Medicine, Cairo Uni., Giza, Egypt.

Abstract: During the past years the Neodynlum YAG laser has become increasingly popular for performing peripheral tridotomy, most irides can be penetrated in one session. A small amount of heamorrhage is common during YAG laser iridotomy. Local oozing of blood inhibited optical breakdown and required a pasuse before completion iridotomy, or other sitting is required specially in dark brown thick irides.
Argon laser pretreatment prior to Nd: YAG laser iridotomy procedure has the advantage only in dark coloured difficult irides otherwise YAG laser iridotomy alone is recommended as the most effective and safest methods.

Summary:

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-M-8, Sun. 27, 15:35**

YAG Laser in Cataract Surgery

Dr. Zeinab S El Sanabary
Faculty of Medicine,
Cairo University.

Abstract: The author will discuss the different uses of YAG laser technogly in cataract surgery. Posterior capsulotomy is the most well established procedure. However, it is not the one; preoperative anterior capsulotomy with its limitations, the recent applications as photophacofragmentation, laser vitreolysis and photophacoemulsification will be discussed.

Summary: When disussing the applications of YAG laser in cataract surgery, the first to be mentioned is posterior capsulotomy, which became a a standard line of a treatment of opacified posterior capsule. However, known possible complications can occur; as damage to the IOL optic, intraocular pressure elevation. cystoid macular oedema, and retinal detachment. During the early 1980s, preoperative anterior capsulotomy with hydration of lens cortex, was investigated aiming at minimizing stress on zonules especially in hypermature cataract. The critical rise of IOP limited its use. Phtophragmentation of the nucleus prior to phacoemulsification and photo-phacoemulsifiation through a special probe will be discussed. Laser vitreolysis for vitreous incarcerated in the wound is another application.

References:
1. Capon MR, Docchio F., et al.: J. Cataract Refract Surg. 1990, 16: 6-3.
2. Dodick JM, Sperber LTD: Ophthalmol Clin North Am. 1991, 4:355.
3. Levin ML, Wyatt KD: J Cataract Refract Surg. 1990, 16:96.

Dr. Zeinab S El Sanabary, M.D. Lecturer of Ophthalmology, Cairo University, Kasr Al Aini School of Medicine.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **IL-M-12, Mon. 28, 9:30**

The Use of Laser in Oesophagogastric Carcinoma in the Gastrointestinal Endoscopy Unit, Cairo University.

Shukry Hunter
Faculty of Medicine
Cairo University.

Abstract: 30 cases of inoperable oesophagogastric carcinomas were subjected to laser therapy. Immediate relief of dysphagia waqs obtained in all cases. Initial responce was relatd to the site and growth pattern of the tumour. Reobliteratoin rate was affected by the tumour extent . No incapacitating side effects were reported. Combined laser and radiotherapy is being studied.

Summary:

References:

Dr. Shukry Hunter is the Director and initiator of the first laser endoscopic unit at Kasr Al Aini School of Medicine. He is the Professor of Endosciopic surgery having a school of young promissing students in this field.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-M-14, Mon. 28, 10:00**

Liver Resection and Laser Hyperthermia

Amr Helmy
Liver Institute,
Menofiya University.

Abstract:

Summary: The vascular nature of the liver and its predilectin to bleed after injury or during the treatment of 1ry and metastatic tumors have naturally focused researchers and clinicians on methods to control hepatic bleeding.
Excessive bleeding at the time of hepatic resection is associated with increased mortality and morbidity rates both at elective liver resection and in the emergency setting.
Understanding of liver anatomy and physiology has combined with certain technical advances to allow surgeons to achieve a degree of control during liver surgery that makes the operation safer.
These technical advances include clinical laser application reduced and relate chniques, which may facilitate resection blood loss and offer the prospect that clinicians may in the near future mange many hepatic tumors without resection.
The disadvantage of the laser technique is that, discrimination of vascular and biliary structures is not posible. With larger vessels in the 2-mm range, cutting without coagulation occurs, thereby increasing blood loss.
Further work by schroder et al in 1987 indicated that the noncontact laser may cause more extensive tissue damage and is not as good as the contact laser at achieving hemostasis

References:

Chariman of Department of Surgery, Professor of Liver Surgery.
liver institute, Menofiya University.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **OP-M-9, Mon. 28, 10:40**

Biliary Laser Lithotripsy using Q-switched Nd/Yag Laser combined wavelenghts 1064 & 532 nm

H. El Gohary,
G. Abdel Fattah,
M.S.Zaki, A. Hendawy*,
M.S. Hunter.
NILES, *Faculty of Medicine.
Cairo University,

Abstract: Gall stones with different types and volumes were successfully fragmented using the Q-swtiched Nd/Yag laser combined wavelenghts 1064 & 532 nm. The total number of pulses for fragmentation of stones was related to the type and the volume of the stones. The effect of laser pusles on the gall bladder wall and temperature rise was determined.

Summary: Biliary laser lithotripsy have been tried by many investigators 1-3 using different specificaions. Data about using combined wavelengths are insufficient. Different types and volumes of gall stones were successfully fragmented in vitro using the Q-Switched Nd/Yag laser combined wavelenghts 1064 & 532 nm. The total framenting number of pusles ranged from 40 to 6000 pulses depending on the type and the volume of the stone. The effect of laser shots on the gall bladder wall was determined by gross and microscopic examination. It is concluded that, the use of combined wavelenghts laser lithotripsy is effective in framenting all types of biliary stones with a wide range of safety to the surrounding tissues.

References:
1. Dayton M. et al.: Copper vapor laser framentation of gall stones: In vitro measurements of wall heat transmission: J. Surg. Res. 45, 90-95, 1988.
2. Ell ch et al: Laser induced shock wavel lithotripsy of gall stones. Endoscopy 18:95-96, 1986.
3. Nishioka NS et al., : Mechanism of laser induced framentation of urinary and biliary calculi laser life Sci. : 1:231-245, 1987.

Hisham El Gohary: MSc., General surgery
MB B.ch, 1987, Cairo University.
Resident of surgery 1989 - 1992 Faculty of Medicine, Cairo University. Now he is a member of the Medical Sector of NILESs and is preparing the MD degree in laser surger.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **OP-M-10, Mon 28, 10:50**

Transurethral Laser Prostatectomy

Ahmed S. Bedair
From the Urology Dept.,
Faculty of Medecine,
Kaser El Aini School,
Cairo University

Abstract: Laser Prostatectomy was performed on 28 patients for the relief of bladder outlet obstruction secondary to benign prostatic hypertrophy (B.P.H.). The mean age was 65.3 years. The type of laser was Nd: Yag laser which can be used through endoscopic instruments. Overall, 72% of patients exhibited good or successful outcome, 16% had fair result and 12% had poor result. There were no intraoperative major complications.

Summary: Laser ablation of the prostatic gland was performed on 28 patients for the relief of bladder outlet obstruction secondary to benign prostatic hypertrophy. The mean age was 65.3 years. The overall prostatic volume in this study was 52.2 cc and all types of prostatic enlargement were treated. The thermal properties of Nd: Yag laser produce an acute sphere of coagulative necrosis which creates sufficient prostatic defect. The initial 12 patients were treated with non contact (lateral firing) laser mode and the following 16 patients were treated with combined technique using both contact and non contact mode in order to minimise patient's discomfort in the early postoperative period. An average of 35,000 joules (12,000-82,000) were used. There were no intraoperative major complications and no blood transfusion was required. Hospital stay ranged between 2-6 days. We evaluated 23 patients at 3 months after laser Prostatectomy. Overall, 72% of patients exhibited good or successful outcome, 16% had fair result and 12% had poor result. Mean symptom scores (Boyasrky index) relatively from 16.1 to 4.4 for a a73.3% improvement. The mean peak flow 7.1 ml/sec preoperatively to 19.5 ml/sec postoperatively. Laser Prostatectomy may be an alternative to endoscopic resection of the prostate (TURP), particularly in high risk surgical patients. Long-term treatment outcomes of this promising new technology are necessary.

References:
1. Costello, A.J., Bowsher, W.G., Bolton, D.M., et al: Laser ablation of the prostate in patients with benign prostatic hypertrophy. Brit. J. Urol., 69;603, 1992.
2. Johanson, D.E. Price, R.E., and Cromeens, D.M.: Pathologic changes occuring in the prostate following transurethral laser prostatecomy. Lasers Srug. Med. 12,254, 1992.

Assistant professor of urogloy, Kaser El Aini School of medicine, Cairo Unviersity.
- M.Sc. degree (Urology) 1979.
- M.D. (Urology) 1983

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **IL-M-15, Mon. 28, 11:05**

Laser in Angiomas

Essam Yacout El Sahwi
Faculty of Medicine
Univeristy of Alexandria
Egypt.

Abstract: Angiomas are frequent lesions in infancey and childhood. Many lines of treatment have been employed in their management, such as surgical excision, corticosteroid injections, and cryosurgery.
Laser is a newly introduced modality for treating such lesions. They have assumed a very important role in the treatment of cutoaneous or superficial lesions for which no reliable and effective treatment has been previously available.
Since June 1993, 70 cases of angiomas have been admitted and treated by Laser in the pediatric surgery unit, Faculty of Medicine, University of Alexandria. The results are good and higly promising.

Summary:

References:

Professor of Surgery
Head of the Pediatric Surgery Unit,
Faculty of Medicine
Univeristyj of Alexandria

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-M-17, Tue. 29, 14:45**

CO2 Laser in Neoplastic Conditions of the Larynx

Maged El Shennawy M.D.
Faculty of Medicine,
Cairo University.

Abstract: The CO2 laser is the main stay of lasers in Otolaryngology. It is the most widely used, well understood and well studied of the medical lasers. It was the first laser to be used in laryngology by Strong and Jako (1972). In this article, the use of carbon dioxide laser in recurrent respiratory benign papillomatosis and its application in glottic and supraglottic carcinoma of the larynx was reviewed.

Summary:

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-M-18, Mon., 28, 15:05**

Tissue Daiagnosis and Photodynamic Therapy Using Lasers

Katarina Svanberg
Department of Oncology,
University Hospital,
S-221 Lund, Sweden.

Abstract: Laser-induced fluorescence (LIF) can be utilized for tissue characteristics and detection of malignant tumour tissue, Especially if tumour marking substances, such as prophyrin containing agents are used for tissue sensitization, a clear demarcaon between tumour and non-diseased tissue is seen. Photodynamic tumour therapy in conjunction with photoactivating drugs, such as haemaoporphyrin derivative or δ-aminolevulinic acid (ALA) provides a new possibility in the treatment of a variety of malignancies.

Summary: LIF (Laser Induced Fluorescence) can be used for non-invasive spectroscopic identificaion of biological tissue and is of special interest in early tumour detection. The basis for this "optical biopsy" method is the intraction of the laser light with tissue chromophores, such as tryuptophan, adenine, collagen, elastin, NADH/NAD+, flavins and B-carotene. The UV-excited fluorescence that arises from th native chromophores, the autofluroescence, has a braod distribution, peaking at about 490 nm with a lower intensity in tumour compared to normal tisuse. The tumour detection peotenaitl is enhanced with exogenously administrated sensitizing agents, such as a variety of prophyin containing substances, such as haematoporphyrin derivative (Photofrin®) with two fluorescence peaks at about 630 and 690 nm. A new way of tissue sensitization is to use the haem precursor δ-amino levulinic acid (ALA). We have developed clinical instrumentation both for tissue point monitoring and for full real-time image processing. Early tumour detection, employing sensitive equipment, can be performed in low-dose Photofirin injected patients if the autofluroescence is included in the demarcation criteri. We have investigated patients in vivo and surgical samples. In vivo measurements were also performed in patients to whom ALA was adminstered orally in a low dose. A variety of different malignant tumours were investigated in vivo, such as tumours in the urninary bladder, the oesophagus, the airway, the gastro-intestinal tract and the ear/nose/throat region. The in vitro measurements were performed in breast tumours and prostatic tumours. Invasive and early tumours and also recancerous lesions can be revealed utilizing LIF in low-dose Phtofrin injected patients. Also ALA given orally is an efficient tumour marker. In connection with PDT we have monitored the fluroescence indifferent kinds of malignant skin tumours.
The autofluorescene shows a lower intensity in the tumour areas compared with normal surrounding tissue. At the same time an increased drug-specific fluorescence at about 630 nm is seen in the tumours. Thus, if the drug-related fluroescence is divided by the autofluroescence, an enhanced tumour demarcation occurs. PDT was performed in about 200 malignant non-melanoma skin tumours in 50 patients and in some cases of lung cancer. Two different drug doses, 1 and 2.5 mg/kg b.w. of photfrin were used 24-48 hours before the laser treatment. The lower drug dose was used in order to minimize the unwarnted skin sensitization. Topical ALA sensitization 4-6 hours prior to the laser treatment was used in about 180 tumours in 45 patients. A total light dose of 60 J/cm^2 was used. The light fluence rate was kept below 100 mW/cm^2 in order to avoid hyperthermic effects. The response rate in the Photonfrin group was 100% in the basal cell carcionomas (BC) and in the metastases of breast cancer with a single laser treatment. In the ALA group a respnse rate of 100% was seen in the superficail BC, 64% in the nodular BC, 90% in the squamous cell carcimas and 50% in the cutaneus T-cell lymphomas with a single laser tratment procedure. The follow-up time for the skin tumours utilzing photofrin varies in between 2 and 5 years. In case of the ALA-PDT tumours the follow-up period is between 5 and 16 months. The drug uptake as monitored by LIF showed a tumour demarcation towards normal skin of about 2-3:1 in the Photofrin group for BC and breast cancer metastases. The dermarcation for ALA was about 6:1 for breast cancer metastases and 12:1 for BC. The laser-induced bleaching was also monitored, as well as the superficial blood flow by means of laser-Doppler imaging. The blood flow showd a restriction immediately after and half an hour post the laser treatment for the Photfrin case while the blood flow in the ALA-sensitized tumours showed an increase. This indicates difrences in the PDT effect for the two sensitizers.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-M-19, Mon., 28, 15:25**

Time-Resolved Spectroscopic Techniques in Laser Medicine

S. Svanberg
Department of Physics,
Lund Instuitute of Technology
P.O. Box 118,
S-221 00 Lund,
Sweden.

Abstract: Time resolved spectroscopy observing fluorescence decay in biological chromophores provides imporved molecular i\dentification and allows stuides of the dynamic behaviour of bio-molecules. Such spectroscopy enables atherosclerotic plaque to be distinguished from normal vessel wall, which can allow spectroscopic guidance in transluminal laser ablation of atherosclerotic plaque.
Time-resoved stuides of optical photon propagatin in tissue is a quickly evolving field with applications in brain oxygenation assessment and the development of optical mamography avoiding ionizing radiation. We have performed extensive studies of absorption and scattering in tissue using white light generated using high power lasers, but also demonstrated tumour detection using simple diode lasers.
Laser-induced X-rays provide ulta-fast and ultra-shai ρ tissue imaging. We have used a chirped-pulse amplification terrawatt laser to generate picoseond pulses of X-rays by focussing on a solid target. Spectroscopic X-ray imaging might be developed using laser-produced X-rays.

Summary:

References:

Professor Sune Svanberg is the head of Physics Dept. at the Tund Institute of Technology. He is an active member of the European Scientists introducing the physical tools of lasers into fields of application tht has direct impact on human benefits. His school on time resolved spectroscopy with deep knowledte in the basics of spectroscopy is new widely known in application fields such as medicine and Environmental studies.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-M-16, Tue., 29, 11:00**

Laser-Induced Fluorescene in Vitro Studies of Human Breast Tumours Following Low-Dose Injection of Photofrin

***Ingrid Wang*[*1], *Ingrid Idvall*[2], *Christian Invgar*[3] *and Katarina Svanberg*[1].**
Departments of [1]Oncology, [2]Pathology and [3]Surgery, Lund Univeristy Hospital, S-221 85 Lund, Sweden.
*Fellow of the Norwegin Cancer Society.
Stefan Andesson-Englels and Sune Svanberg.
Atomic Phyysics Division, Lund Institute of Technology, P.O.Box 118, S-221 00 Lund, Sweden.

Abstract: Human breast cancer is the most common malignant tumour in women. Althoug a variety of diagnostic methods are being used, many tumours have alreaady metastasized at the time of discovery. We have studied the uptake of the photosensitizer Photofrin® in breast malignancies by means of laser-induced fluorescence (LIF). The use of Photfron® in LIF diagnosis or in the treamtment of breast cancer with Photdynamic Therapy (PDT) might be additional tools in the handling of thes malignancies.

Summary: Human breast cancer is the most common malignant tumour in women. The tumour diagnosis comprises manual palpation, X-ray mammography and fine needle aspiration for cytological examination. The X-ray investigation may in some cases of lobular carcinoma without retraction phenomenon and in certain types of invasive tumours with comeao strucures give false negative results. Also the fine needle aspiration procedure may fail to hit the disseased tissue and also result in false negative outcome. Tissue characterisation utilizing laser-induced fluorescence (LIF) might be a conceivable way of enhancing the sensitivity of the diagnostic procedure.

We have performed a study in order to investigate the uptake of porphyrins in neoplasias in the female breast tissue. Women with positive mammaography and cytological biopsies where asked to take part in the study. The patiens we given the hematoporphyri derivative Photofirine® which is a photodynamically active substance. Photofirine® was adminsitered intravenously in a low dose of 0.35 mg/kg b.w. 24 hours before the planned surgical procedure. Immediately after surgery, consiting of either mastectomies or segmental resections, the patholgic specimen was investigated with laser-induced flurorrescence using an optical multichannel analyzer system. The tissue was excited with near ultraviolet laser light from a pulsed nitrogen pumped dye laser (405 nm). The excitation light was passed to the sample through an optical fibre and the fluorscence from the excited tissue was transmitted back through the same fibre and analyzed spectroscopically. Afterwards the investigated tissue sample was prepared for histological investigation and a full size section of the whole specimen was cut. The spectrroscopic results were correlated point by point with the histological diagnose.

The study shows a good demarcatoin between the surrounding breast parenchyma and invasive and in situ cancerous tissue. The border of th tumour could be detected and the free non-tumour invaded resection margin monitored in order to judge the tumour radically obtained in the surgical procedure.

We plan to perform the LIF examination peroperatively for real-time monitoring of the tumour borders. We will also perform the examination in conjunction with the cytolgocal biopsy, passing the optical fibre through the biopsy needle for guiding the biopsy sampling and enhancing the value of the information available from the cytology. By giving treatment doses of Photofirine® one can perform photodynamic therapy (PDT) in connection with the surgical procedure. This can be done by intersitial illuminating of the tumour with laser light within the red wavelenght region (630 nm) 24-48 hours after the sensitizer in order to reduce the tumour mass before surgery. The illumination can also take place peroperatively after the main tumour is removed to enhance the radiclity of the surgical procedure.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-M-20, Tue. 29, 9:00**

Lasers In Dermatology

U. Hohenleutner,
M. Landthaler
Department of dermatology,
University of Regensburg,
Germany

Abstract:

Summary: Different lasers have greatly enriched the therapeutic armament of dermatology. Especially for vascular lesions like port-wine stains, teleangiectases or hemangiomas. Laser therpay is the treatment of choice. Differential treatment with the argon-ion, the high-power argon-ion, the flashlamp-pumped pulsed dye (FPDL)- and the Nd: YAG laser according to patient age and kind of lesion has further imporoved the results. With tunable FPDL-lasers, treatment may become even more specific, and other targets for selective phtothermolysis, like pigmented lesions, seem possible in the future. For exophytic lesions like virus papillomas etc. CO2-laser surgery is successful, and Nd: YAG laser hyperthermia seems promising in warm treamtment. The Q-switch ruby laser, like other Q-switch lasers, is evaluated in scar-free tattoo removal and treatment of pigmented lesions, and the Er: YAG laser for photoablation of skin lesions. We present our results in over 1200 patients with these lasers and give an overview of the state-of-the art of laser application in dermatology.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-M-21, Tue. 29, 9:30**

An Update of the Use of Laser in Dermatology

Amal K. Kurban, M.D.
Boston University
Medical Center.
Boston, M.A.
U.S.A.

Abstract:

Summary: During the past 30 years, laser technology has advanced rapidly. Dermatology has been at the forefront of medical science disciplines utilizing this versatile modality both in research and therapy. The presentation briefly reviews the unique characteistics of laser light (monochromatic, coherent, application, and the basic laser-tissue interactions (thermal, mechanical, and accuostic mechanisms).

The laser equipment available for dermatologies use includes CO_2, Nd: YAG . Argon, Ruby, Copper Vapour and Falshlamp tunable dye laser. These vary in their selectivity and specificity and hence, in their usefulness, efficiency, and side-effects in the treatment of benign vascular disorders, pigmented lesions and selected tumrous growths. Our 6-year experience in this field will be presented.

References:

Professor Dr. Amal K. Kurban is the professor of Dermatology at the university of Boston. She is leading a research group on following up and applying lasers in dermatology. Her school is considered one of the active U.S.A. groups dealing with this subject.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-M-22, Tue. 29, 10:00**

Laser for Dermatologic Purposes

Abdelaal M.A., M.D.
Faculty of Medicine
Al Azhar University.

Abstract: Lasers are developed initially for industrial and military purposes. There are many types of lasers, every type has its own merits. In this communication, laser its evolution uses and side effects will be discussed.

Summary:

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-M-23, Tue. 29, 10:30**

Nd: YAG laser Hyperthermia in the treatment of recalcitrant verruca vulgaris. (Regensburg's technique)

Talal Ahmed Abd-El Raheem[1,2].
Alexander Pfau[1],
Wolfgang Baumler[1],
Ulrich Hohenleutner[1],
Michael Landthater[1].
1Dept. of Dermatology, Univeristy of Regensburg, Germany.
2Department of Dermatology, STD and Andrology, El-Menaia University, Egypt.

Abstract:

Summary: Heat therapy of cutaneous diseases has been used for decades. During the last years several kinds of energy sources, including electromagnetic energy from raidofrequency, microwaves, sonic energy from ultrasound have beeen used to produce local hyperthemia. The general princple of this treatment is based on the fact that the disease tissue being treated is more sensivitve to the effects of elevated temperture than normal tissue and thus less able to recover after heat exposure.
We report the case of a 54 years old female patient with recalcitrant verrucae vulgares on her little finger of the right hand and on her left sole who was treated with Nd: YAG laser hyperthermia. laser energy was applied two times with an interval of six weeks. Laser output, power was 10 watts, spot size 8 mm and irradiation time up to 20 seconds. By this technique, it was possible to receive a surface temperature of about 40 C for 30 seconds. After hyperthermia no skin changes like whitish discoloration, blistering or crusting were observed. Having completed the second course a total remission was stated. No recurrence was seen in a follow-up period of three months so far. This method could be used in the treatment of recalcitrant warts on the fingers and hands. Periungual and other parts of the body including plantar surfaces.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-M-12, Tue. 29, 14:15**

Laser Treatment of Cutaneous Malignancies

Amal K. Kurban, M.D.
Boston University
School of Medicine.
Dept. of Dermatology,
Boston, MA
U.S.A.

Abstract:

Summary: Skin malignancies are commonly encountered, and in certain regions constitute the most frequent of human neoplasmas. Recent advances in laser technology have prompted the use of lasers in the treatment of cutaneous malignancies. The choice of lasers in treating skin cancer depends on several factors including whether or not the neoplastic tissue has an inherent light-absorbing chromogen. In the former category are vascular and melanocyte tumors. Theorectically, such tumors can be treated by lasers with wavelenghts preferentially absorbed by hemoglobin and melanin respectively. Tumors that lack such chromogen could be ablated by the use of lasers absorbed by water and protein. Another method gaining popularity is photo-dynamic therapy (PDT). In PDT, an endogenous dye that is preferentially taken up by the cancerous tissue is administered and then the cancers irradiated with a laser selectively absorbed by the oxogenous dye in the cancer cells. Advantages and disadvantages of cancer laser treatment will be emphasized.

References:

Professor Dr. Amal K. Kurban is the professor of Dermatology at the university of Boston. She is leading a research group on following up and applying lasers in dermatology. Her school is considered one of the active U.S.A. groups dealing with this subject.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-M-13, Tue. 29, 14:45**

The Argon Laser in Dermatology

El Zawahry M.B, M.D.
Faculty of Medicine,
Cairo University.

Abstract: 60 patients were treated with the argon laser for a wide variety of vascular and pigmented lesions. The preliminary results indicate that the argon laser is a very useful tool in the treatment of vascular and pigmented conditions. However, complete disappearance of lesions was not the rule. Assessment of the results will be presented.

Summary: 60 Patients, 50 females and 10 males, were treated with the argon laser for a wide variety of vascular and pigmented lesions. 18 patients had port-wine stains, 10 had nevus of Ota, 9 had nevus spilus and 8 had freckles. Becker's nevus was present in 3 cases and pigmented nevi in 2. Melesma, incontinentia pigment, post inflammatory hyperpigmentaint, Von Recklinghausen's disease'syringoma, telangiectasia, spidertelangiectasia, haemangiolymphangiom a, adenoma sebaceum and pigmented epidermal nevus were treated in one case each. The preliminary results indicate that the argon laser is a very useful tool in the treatment of vascular and pigmented conditions. However, complete disappearance of lesions was not the rule. Most cases showed 60% - 80% improvement, especially port-wine stains, telangiectasia and superficial pigmented lesions such as freckles and nevus spilus. Nevus of Ota, melasma and post inflammatory hyperpigmentaon gave unsatisfactory results. The most important, although transient, complained was post inflammatory hypepigmentation in the treated areas. Epidermal atrophy and textural changes came second on the list, were mild and improved by time. Scarring was not as common as expected, may be due to the conservative techniques used, was present in one case, and improved dramatically with topical and intralesional steroids.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-M-14, Tue. 29, 15:00**

Complications of Flashlamp-pumped Pulsed Dye Laser, A prospective Study.

T.A. Abd El-Raheem
U. Wlotzke
W. BAumler
U. Hohenleutner,
M. Landthhaler
Dept. of Dermatology, Regensburg University, Germany.
Dept. of Dermatology, STD and Andrology, El-Menia University, Egypt.

Abstract: Medical laser technology began in 1960s with the skin being one of th first target organ systems to be approached. In the past decade, significant advantages have been made in the use of lasers for the treatment of a variety of cutaneous disorders.

Summary: The flashlamp-pumped dye laser was the first laser specifically designed for cutaneous vascular lesions. The theoretical advantages of the flashlamp-pumped dye laser have been confirmed in numerous clinical studies for the treatment of PWS, telangiectases, and hemangiomas.
In this study we are documenting the different complications which occur to patients treated with the flashlamp-pumped pulsed dye laser. We are reproting also, the different intensities of pain experienced by patients during and after the treatment.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **IL-M-24, Mon. 28, 15:50**

Laser Management of Bilateral Vocal Cord Paralysis

Mohamed A. Hegazy
Faculty of Medince, Cairo University.

Abstract:

Summary: Patients of both cords often result from damage of both recurrent laryngeal nerves during thyroidectomy. The condition is usually manifisted by chronic stridor that may be exaggerated by an attack of laryngitis which may be life threatening requiring immediate trachesotomy. Surgical treatment in the form of cordectomy and arytenoidectomy were described through laryngofissure or endoscopic aproachs. Unpredictable formation of scar tissues may account for the frequent treatment failure encountered when such surgical modalities are used. Arytenoidectomy using (CO_2) laser become now the method of choice by most authors for treatment of bilateral abductor paralysis. The Use of CO_2 laser attached to the operating microscope enable precise, hands-off, relatively bloodless endoscopic laryngeal surgery. The amount of scar tissues are minimal. The airway is imporoved with minimal affection of voice production.

References:

Dr. Mohamed Hegazy, Professor of otorhinolaryngology.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-M-17, Tue., 29, 15:30**

Laser Induced Fluroescence Studies of Meso-Tetra (hydroxyphenyl) Chlorin in Malignant and Normal Tissues in Rats

Wael Alian1,
Stefan Andersson-Engels[1,2]
atarina Svanberg[1,3] and
Sune Svanberg[1,2]
[1]Lund University Medical Laser Center
[2]Dept. of Physics, Lund Institute of Technology P.O. Box 118, S-221 00 Lund, Sweden
3Dept. of Oncology, Lund University Hospital, S-221 85 Lund, Sweden.

Abstract: Meso-Tetra (hydroxyphenyl) chlorin (mTHPC) is an attractive second-generation photosensitiser for use in photodynamic therapy. In this study, 1.3 mg kg-1 body weight mTHPC was administererd intravenously, and laser-induced fluorescence was used to characterise and compare its localization and retention in different rat tissues, including an induced experiemental adenocarcinoma, 24 h and 48 h post injection.

Summary: Photodyncamic therapy (PDT) involves the adminstration of a photsensitiser that is retained with some selectivity in tumour tissue when compared with the surrounding tissue. After a specific time interval, the tumour is illuminaated with light of an appropriate wavelength. This brings about the phtoactivation of the sensitiser in the tumour and the generation of singlet oxygen and other cytotoxic free radicals and subsequent local cell death. So far a haematoporphyrin derivative (HPD), Phtofrin, has been almost exclusively used as the the photosensitiser in clinical PDT. meso-Tetra (hydroxyphenyl) chlorin (mTHPC) is an attractive second-generation dihydroporphyrin photosensitiser. It is characterised by superior tumour selectivity, absorption in the red spectral region at aobout 650 nmm, a high rate of photbleaching and only moderate skinphotsensitisation when compared with HpD. In this study, 1.3 mg Kg-1 body weight mTHPC was adminstered intravenously, and laser-induced fluorescence was used to characterise and compare its localisation and retention in different rodent tissues, including an induced experiemental adenocarcinoma, 24 h post injection. These studies were performed in an attempt to clarify possibilities and suitable injection/irradiation intervals for the use of this sensitiser in the photodyanamic therapy (PDT) of tuours in relation to each individual tissue, in particular the intra-abdominal and intra-thoracic tissues. The fluorescence was induced with a dye laser, pumped by nitrogen laser, emitting light at 405 nm. The laser light was focused onto the tip of a fluorescence-free 600 μm optical fibre the distal end of which was held in contact with the tissue underinvesigation. The fluorescence light was transmitted back via the same fibre, through a dichroic mirror, and was focused at the 100 μm entrance slit of a polychromator. The dichroic mirror, in addition to a 455 nm cut-off filter, served to block out any reflector and the fluorescence spectrum in the region 455-470 nm was analysed. The obtained spectra were spectrally corrected for non uniform efficiency in detection. The recorded spectra, each of which integrates the total fluorescence produced from 50 laser pulses, were stored on computer disks for later analysis. All spectra were dominated by the fluorescence signature of mTHPC with its peak at 652 nm and all values were expressed terms of background-free drug-specific fluorescence intensity at that wavelength. The average dermacation between tumour and surrounding tissue (muscle) for the tumour model used, at 24 and 48 h post injection, were 9:1 and 7:1, respectively. The photsensitiser accumulated in high concentrations in the reticuloendothelia system. Muscular organs, such as the heart and the abdominal wall, were characterised by low drug fluorescence signature. Compared with the results of previous model and very similar measurement equipment, mTHPC exhibits significantly better tumour selectivity than Photofrin, in addition to the newer sensitisers BPD-MA, PHE and TSPc. Our results further suggest that mTHPC-PDT in the abdominal or thoracic cavity would probably be safer and more efficient if performed at periods exceeding 48 h post injection in order to allow sensistiser concentrations in the liver, spleen and lung to drop. On the other hand, in tumours confirmed to, or in close proximity to muscular organs, earlier irradiation would perhaps be advantageous, since the tumour/muscle demarcation does not appear to improve significantly with time and the overall sensitiser concentration is much higher at earlier time points.

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **IL-T-1, Sun. 27, 9:00**

High Power CO_2 Laser for research and applications

J. Uhlenbusch
Heinrich-Heine-
Univeristy of Dusseldorf.
Dusseldorf,
Germany.

Abstract:

Summary: High power CO_2 lasers are a very successful tool to perform basic physical experiments and to handle applied processes. The first part of the lecture deals with the properties and functions of a pulsed CO_2 laser system (repetition rate max. 200 kHz, pulsed power max. 2 MW, average power max. 7 Kw). The construction of an upgraded system is introduced. The laser is well suited to ignite and sustain a transient plasma near the laser focus. Due to the fast repetion rate the absorption of laser radiation exceeds 50% even at moderate pressure level (30 kPa). These so called optical discharges are very intersting light sources for the XUV, they can be used to evaporate powders for the formatoin of superconducting layers and are advantageously employed to cut and weld metals like Al and Cu. Practical examples are given.

References:

Professor dr. J. Uhlenbusch is the vice dean of the Heinrich-Heine University of dusseldorf. He is an active member of the laser applications in industry and material processing. He initiated one of the most important CO2 laser facility in Germany.

Programme chair: **SUNE SVANBERG**,Lund Technical Institute (SWEDEN)
Programme Committee: **Abdel Kader Mansour**, A.S. ELRAEI, S. IBRAHIEM,
G.A.FATTA, M. OMER (NILES)

SUNDAY MARCH 27, 1994

Session 4 (Morning) **9:00-11:15**

Theme chairs: **C. Grey Morgan, Hassan Talaat.**

IL-T-1 **J. Uhlenbusch**, Heinrich - Heine Univ. Dossel. (GERMANY) 9:00-9:30
High Power CO2 laser for research and applications.

IL-I-2 **Z. Mucha**, Polish Academy of Sciences (POLAND) 9:30-10:00
Advanced Technology of Laser Micromachining.

OP-T-1 **MK. El Adawi**, Ain Shams Univ. (EGYPT) 10:00-10:20
Laser Heating of a two-layer System with constant Surface Absorptance, An Exact Solution.

OP-T-2 **M. Atta**, NILES, Cairo Univ. (EGYPT) 10:20-10:30

OP-T-3 **S.W. El Moogy**, NILES, Cairo Univ. (EGYPT) 10:30-10:40
Deposition of D.L.C. by N2-Laser ablation of graphite.

OP-T-4 **Ahmed Asaad**, NILES, Cairo Univ. (EGYPT) 10:40-11:00
Laser Beam Welding for two Metal Flat Surfaces.

OP-T-5 **M. Kotab**, NILES, Cairo Univ. (EGYPT) 11:00-11:15
N2-Laser Beam interaction with Ti and TiC targets.

COFFEE BREAK (Location cafeteria OLC 3rd floor) **11:15-11:30**

Sessions (SEE KEYNOTE LECTURES) **11:30-12:30**

QUICK LUNCH (Location cafeteria OLC & Univ. Guest House) **12:30-13:30**

Session 6 (SEE PLENARY LECTURES) **13:30-14:00**

MONDAY MARCH 28, 1994

Session 9 (Morning) **9:00-11:15**

Theme chairs: **J. Uhlen busch, M. Mele**

IL-T-3 **Michel Voos**, Ecole Normal Superieur (FRANCE) 9:00-9:30
Semiconductor Quantum Well Lasers and Communication.

L-T-4 **Hassan Talaat**, Ain Sham University (EGYPT) 9:30-10:00
Raman Scattering/A Versatile tool for Characterization of Semiconductor Hetero-Structures.

OP-T-6 **Khairia Darwish**, Faculty of Science, Cairo Univ. (EGYPT) 10:00-10:20
Radative Recombination in GaP Doped with Nitrogen.

OP-T-7 **Tarek A. Ramadan**, Faculty of Engineering, Ain Shams Univ. (EGYPT) 10:20-10:40
Carrier Collection in Semiconductor Single Quantum Well Structure.

OP-T-8 **M. Mounir**, Faculty of Science, Cairo Univ. (EGYPT) 10:40-11:00
A study of the Luminescence spectra of GaInP.

OP-T-9 **M. Hanafi**, NILES, Cairo Univ. (EGYPT) 11:00-11:15
Magneto-optic Recording.

COFFEE BREAK (Location cafeteria OLC 3rd floor)	**11:15-11:30**
Session 10 (SEE KEYNOTE LECTURES)	**11:30-12:30**
QUICK LUNCH (Location cafeteria OLC & Univ. Guest House)	**12:30-13:30**
Session 11 (SEE PLENARY LECTURES)	**13:30-14:00**

TUESDAY MARCH 29, 1994

Session 14 (Morning) **9:00-11:15**

Theme chairs: **Sune Svanberg, A.S. El Raei.**

IL-T-5 **L. Woste**, Freie Univ. Berlin (Germany) 9:00-9:30
Monitoring atmospheric Polutions by LIDAR.

IL-T-6 **Dan J.** Radecki the Electro Optic Organization (USA) 9:30-10:00
An IR absorption Spectrometer for Measuring Natural Gas Constituents.

OP-T-10 **M. Walid**, NILES, Cairo Univ. (EGYPT) 10:00-10:15
Propagation of High Power Nd: YAG Laser in Water and Water Vapour

OP-T-11 **Helmy S. Hassan**, NILES, Cairo Univ. (EGYPT) 10:15-10:30
Detection of Corn Kernal Defects Using Visible Laser Inspection Technique.

OP-T-11 **A. Rahman Elwi**, NILES, Cairo Univ. (EGYPT) 10:30-1[illegible]
Policy Regulations to Control Safety Aspects of Using Laser Systems in Egypt.

OP-T-12 **S. Ibrahime, NILES, Cairo Univ. (EGYPT)** 10:45-11:00
Analyss of LIDAR Spectroscopic Data.

COFFEE BREAK (Location cafeteria [illegible] floor)	**11:15-11:30**
Session 15 (SEE KEYNOTE LECTURES)	**11:30-12:30**
QUICK LUNCH (Location cafeteria OLC & Univ. Guest House)	**12:30-13:30**
Session 16 (SEE PLENARY LECTURE)	**13:30-14:00**

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-T-1, Sun. 27, 10:00**

Laser Heating of a Two-Layer System with constant surface absorptance- An-Exact Solution

M.K.El Adawi
M.A. Abdel Naby
S.A. Shalaby
Dept. of Physics and Math.,
Faculty of Education
Ain Shams Uni.
Cairo, Egypt.

Abstract: Laser heating of a two-layer system is studied using Laplace integral transform method.
Expressions for the temperature profiles within the thin film and the substrate are obtained. Four systems are considered. The critical time intervals required to initiate melting are also obtained.

Summary: Laser solid interaction is a serious problem that has aroused the interest of many investigators. The present work aims to solve the laser heating problem for a two-layer system thin film on a substrate using Lapalace integral transform method.
The heat diffusion equations in both layers are solved using the considered technique.
Computations are carried out on four two-layer systems. The obtained results show that:

1. The temperature profiles are linear functions of the absorbed heat power at the irradiated front surface. While, they are not linear functions of the thermal properties of the considered system.
2. The obtained values for the critical time required to initiate melting make it possible to decide whether damage can be initiatd within one laser pulse duration or not.

References:

Department of Physics and Mathematics, Faculty of Education, Ain Shams University, Cairo, Egypt. Professor Dr. M.K. El Adawi Chairman of Physics & Mathematics Dept. is initating an active theoritical group to study the applications of lasers in industry.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-T-2, Sun. 27, 10:00**

Micro Arc Plasma Diagnostic Using Photo deflection System.

Magdy Omar
M.A. Atta
NILES, Cairo University.
Giza, Egypt.

Abstract: Photo deflection technique has been used for sensing and discriminating between electrons and neutral particles in multi-component micro arc plasma. With short arc duration (1 ms - 10 ms), high voltage 30 KV and arc current (80-260 A), under high vacuum (10-7 m bar), plasma produced due to the discharge between the target as the disc cathode and pin anode. The velocities of the electrons and the neutrals particles has been determined by using photo deflection technique. The results were compared with the other methods.

Summary:

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-T-3, Sun. 27, 10:30**

Growth of Diamond Like Carbon During N2-Laser Ablation of Graphite

Shawky W. El Mougy
M. Omar
Loftia El-Nadi
NILES,
Cairo University, Giza, Egypt.

Abstract: N2- laser with peak power density in excess of 1011 W/cm2, was used to ablate graphite under high vacuum forming carbon vapour plume. The ablated carbon was allowed to deposit on glass substrates at different distances from the graphite target and parallel to its surface. The deposited films were inspected optically using an image processing system, where amorphic diamond structure with high percentage of sp3 bonds were characterised.

Summary: Targets of graphite have been subjected to focused N2- laser pulses of different intensities at an angle of 45 degrees. The N2 - laser pulse duration of 15 ns and wavelength of 337..1 nm was focused using quartz lens to a diameter of 200 μm providing powers up to 1011 W/cm2 per pulse. The ablated carbon plume was allowed to deposit on glass substrates situated parallel to the target surface at distances from 0.7 to 3 cm and permitting the laser beam to hit the target center, without changing the bombarding position. An overall of up to 1200 pulses were used to grow a thin carbon film during one hour. The deposited films were examined optically using an image processing system type. The growth of amorphous diamond like carbon (DLC) crystallites was recognised to have sp3 bond, reaching diameters of 3 mm at a target - substrate distance less than 1 cm. As the target distance increases the crystallite size decreased but their number increased. The adjustment of growth conditions for further temperature and geometry of the substrate is in progress.

References:

1. J.Stevefelt and C.B. Collins, J. Phys. D: Appl. Phys 24 (1991) 2149-2153.
2. K.Athwal, A. Mele and E.A. Ogryzlo, Diamond and Related Materials, I (1992) 731-734, Elsevier Science Publishers b.V., Amsterdam.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-T-5, Sun.27, 11:00**

N2-Laser Beam Interaction with Ti and TiC Targets

M. A. Kotb
S.W. El-Mougy
M. Atta
Loffia El-Nadi
NILES
Cairo University.

Abstract: Short pulses with highest power N2-Laser radiation is suitable for interaction with high quality surfaces. This work deals with the interaction processes on surfaces of Ti TiC and ceramic materials with N2-Laser radiation.
The effect of different number of shots of N2 Laser beams has been examined on Ti and TiC and surfaces and compared with interaction of N2- Laser and excimer laser of previous work and ceramics.

Summary: The interaction between N2-Laser beam and Ti and TiC surface has been studied at different number of pulses (1-1000 pulse). The N2-laser (337 nm) has a power 1 MW, energy 12 mj, duration time 7 ns and repetition rate 1 Hz. The N2 laser beam was focused normal to the target surface by spherical lens of 15 cm focal lens to give a fine spot and high intensity 10^{11} W/cm^2. The marks on the titanium Carbide surface could be as fine as 200 μm diameter. The damage on ceramic surface was obtained as well with lower total irradiance than on Titanium Carbide. These data are compared with previous work (1) using excimer laser radiation on Ceramics.

References:
1. H.K. Tanshaff, O. Gedral, SPIE Vol. 1132 High Power Laser and Laser Mchining Technology (1989).

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-T-6, Mon. 28, 10:00**

Radiative Recombination in GaP doped with Nitrogen

M. Mounir & K.A. Darwish
Address:
Department of Physics,
Faculty of Science,
Cairo Univeristy.

Abstract: The luminescence spectra of GaP shows a large number of sharp lines. These lines desxcribe the recombination between electrons and holes, donor acceptor pairs, bound exitons and exictonphonon interaction. Other lines correspond to decay of excitons bound to point defects.

Summary: The samples of GaP are thin layers of p-n junction grown on substrate of pure GaP. The three layers are obviously shown by scanning electron microscope.
The isoelectronic affinity of nitrogen for phosphorus in GaP causes a strong short range perturbation which introduces new electronic bound states into the forbidden gap.
At low temperature and high concentrations of nitrogen (~ 1018/cm3), the luminescence spectra shows many sharp lines which arise from the recombinatin of electrons trapped on donors with holes trapped on acceptors, other lines correspond to the decay of excitons bound to point defects. The aim of this work is to study the effect of nitrogen concentrations and the effect of temperature on the line spectra (A exciton, NN lines, Donor acceptor pair and phonon replica).

References:
1. M. Mounir, N.R. Nurtdinov, R. Stegman and A.E. Yunovich. Sov. Phys. Semicond., 15, (1981).
2. A. Baldereschi. J. of Luminescence, 7, 79-91 (1973).
3. M. Mounir. J. Laser and Tech., 1, No. 1, 33-36 (1987).

K.A. Darwish
B.Sc. 1969- Demonstrator 1969
M.Sc. 1973 - Assistant Lecturer 1973
Ph.D. 1980 - Lecturer 1980
Associate Professor 1988 at the physics dept., Faculty of Science, Cairo University.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30, 1994 **IL-M-4, Mon. 28, 9:30**

Raman Scattering / A versatile tool for characterisation of Semiconductor Heterostructures.

Hassan Talaat
Dept. Physics,
Faculty of Science
Ain Shams University
Cairo, Egypt.

Abstract: An expose of Raman spectroscopy as a tool to provide useful information on characteristic properties of semiconductor layers, surfaces and superlattices, is given. Crystal orientation, carrier concentration, scattering time of charge carriers, composition of mixed crystals, depth profiles and interfacial bending can be studied in semiconductors thin layers and Heterostructures. The advantages and disadvantages of Raman spectroscopy compared to conventional characterisation methods are given.

Summary:

References:

Hassan Talaat: Professor of Laser Physics at the Department of Physics, Faculty of Science, Ain Shams University.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-T-7, Mon. 28, 10:20**

Carrier Collection in Semiconductor Single Quantum Well Structure

Tarek A. Ramadan
Electronics & Electrical communication Eng. Dept.
Faculty of Eng. Ain Shams University.

Abstract: We introdue a mathematical model for the carrier collection in SQW using Boltzaman transport equatin. We find an inrease in the distribution function within the polar optical phonon energy strip. The oscillatory behaviour of the scattering rate with the well width Lz is shown to depend on the direction of electron motion. The capture time shows saturation with Lz in agreement with experimental results.

Summary: A mathematical model for the carrier collection problem of a separate confinment SQW structure in the presence of an electric field associatede with current injection is introduced using Boltzman transport equation. Linearized solutions for the distribution function of carriers in the barrier region of both GRIN. SCH and SCH cases are obtained. We find an increase in within the polar optical phonon energy strip responsible for carrier collection which explains the efficiency of collection. The oscillatory behavior of the scattering rate with the well width is shown to depend on the direction of the electron motion normal or parallel to the band edge discontinuity. The electron capture time is calculated using a non equilbrium non linear relaxation time. solution in the well region. The capture time shows saturation with the well width in agreement with experimental results.

References:

Born on 1966, Egypt, B.Sc. in 1989, and M.Sc. in 1993 from the ECE Dept. Faculty of Engineering, Ain Shams University. Since 1990 working as a teaching assistant at the same Dept.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-T-8, Mon. 28, 10:40**

A Study of the Luminescence Spectra of $Ga_x In_{1-x} P$

M.Mounir,
H.M.M. Mansour and
S.M. Abdel Wahab[1].
Department of Physics,
Faculty of Science,
Cairo University.
[1] Dept. of Physics, Faculty of women, Ain Shams University.

Abstract: The ternary compound $Ga_xLn_{1-x}P$ has a maximum direct band gap 2.2 ev at room temperature. The value is strongly dependent on compositon (x). These samples were prepared by liquid phase epitaxy on pure Ga P substrates. The ternary alloy Ga In P was doped with nitrogen as an isoelectronic trap from a flow of ammonia and hydrogen gas over the solution. The crystal changes in color from grey to orange with increasing the mole fraction of GaP.
The data of the experimental lumoinescence spectra of $Ga_xLn_{1-x}P$ were performed at room temperature. A theoretical analysis has been performed for the luminescence spectra in Ga_xLn_{1-x} P. The experimenal data are in agreement with the theoretical results.The alloys wer kindly supplied by I.K. Lazerova completed with its analysis and compsotion ratio. The authors are greateful to Prof. A.E. Yunovich (Moscow University, Faculty of Physics, Semoiconductor department) for providing samples and technical assistance.

Summary:

References:

Dr. M. Mounir is the professor of experimental solid state physics at the physics dept., Faculty of Science, Cairo University. He has established a laboratory for studying the optical properties of semi conducting materials.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-T-9, Mon. 28, 11:00**

Thin Films for Optical Recording

Lotfia El Nadi
Magdi Omar
Mahmod Hanafi
NILES
Cairo University,
Giza , Egypt.

Abstract: The physical properties of thin films of Mn-based systems are investigated. Bilayers of amorphous metal/Mn are prepared and tested for MO recording. The polar Kerr rotation in terms of propagation characteristics using Argyrus formula are calculated and compared to those of prepared thin films. Conclusions are drawn as to optimise the thin film design.

Summary:

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-T-11, Tue. 29, 10:15**

Detection of Corn Kernel Defects Using Visible Laser Inspection Technique

Helmy S. Hassan
A. El Raie*
Lotfia El Nadi
NIlES, Cairo Uni.,
* Faculty of Agric. & NILES
Giza, Egypt.

Abstract: The optical properties of the corn kernel of different grades were studied using laser light of wavelengths 523, 632.8 and 670 nm respectively. An optoelectronics system was setup and measurements of reflection and transmission using multi-colour He-Ne laser and diode lasers of different powers were carried out. Absorption coefficient for different types of corn kernel defects were detected with high accuracy of up to 85% when using laser wavelength 632.8 nm at power of 3 mv.

Summary: Quality problems with corn quality assessment have increased, since, greater amounts and proportions of corn are combined shelled, artificially dried and moved through several market channels. Thus, evaluating corn for quality in a quick clean way is very important. Optical method using fine laser directional beams worth to be checked. In the present study an optoelectronics system was setup where reflection, absorption, and transmission through corn kernel could be measured. Multicolour He-Ne laser wavelength 523 and 632.8 nm and diode laser of 670 nm wavelength were used as light sources. The ratio between reflected and transmitted intensities were measured using photodetectors. This ratio was found to be high for sound corn kernel at incident angle of 45 degree. The best optimum conditions were found to be attained by He-Ne laser of wavelength 632.7 nm and power of 3 mv. The transmission intensity form defective corn kernel was found to be high and reflection was found to be low compared to that of sound corn kernel. The absorption coefficients for different types of defects were calculated indicating the quality. The optoelectronics system was setup in a simple way suitable for use in corn seeds stations, for evaluating the different methods of Agromachining processes utilised in handling and transportation of corn.

References:
1. Gunaskaran, S. and M.R. Paulsen. 1986. Automatic non destructive detection of corn kernel defects. In international advances in non destructive testing 12:95-116.
2. USDA. 1978. The Official United States Standards for Grain. Federal Grain Inspection Service, Inspection Division, U.S. Department of Agriculture.

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-T-11, Tue. 29, 10:30**

Policy Regulations to Control Safety Aspects of Using Laser Systems in Egypt.

Abdel Rahman Elwy
NILES, Cairo University.

Abstract: The use of lasers in Egypt has increased enormously in the last few years in the different fields of application as well as in universities and scientific institutions. Niles has taken charge of establishing the measures and standards required to fulfil safe use of lasers and laser equipment.
A committee is comprised of representatives from various governmental organisations and educational institutions.

Summary: For safety purposes, laser beams of any type should be considered hazardous to the body and viewing the direct or reflected rays from any type of laser equipment should be avoided when handling any power-level laser equipment. The vast increase in using lasers and laser equipment in medicine, agriculture, industry and technology as well as in scientific research in universities and institutions necessitate the need of strict supervision and control of such equipment and personnel using them.
A committee is comprised from various professional governmental organisations and educational institutions to establish national laser safety standards and the rules and regulations that should be applied to meet these standards.
A policy is also foreseen for the training of personnel using laser equipment, whether operator, researcher or maintenance team. The training should include fundamentals of laser operation, the bioeffects of laser radiation on the eye and skin, the non-radiation (non-beam) hazards, the control measures and the methods of safe use of lasers.

References:

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Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-T-13, Tue. 29, 11:00**

Photothermal Deflection as a Measure of Distrotion of Mn-Thin Films

Lotfia El Nadi
Magdi Omar
Arafa Kassem
NILES
Cairo University,
Giza, Cairo.

Abstract: The thermal distortion of thin Mn films on a glass substrate and on metal substrate, produced by a diode laser beam, was measured using optical methods and P.T.D. Methods. The photothermal induced changes are tested for MO recording. We anticipate that the results of these measurements will help elucidate the photoinductive effect induced in a coil placed over the films.

Summary:

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **OP-T-13, Tue. 29, 11:00**

Land Levelling for Efficient Irrigation

F. El Hessy, 1
D. El-Quosy, 2
W. Klada 3
A. El-Raie 4

Abstract: Land levelling is a prime important factor in attaining efficient water use in surface irrigated areas. Using laser controlled equipment for land levelling when applying water by surface irrigation give precision levelling which are not achieved using the conventional methods.

Field experiment showed that introduction of laser levelling enabled to use longer furrows and resulted improved yields for sugarcane and sugar with less amount of irrigation water which leads to better efficiency.

Summary:

References:

1. Senior Researcher and Head of Water Distribution Department, Water Distribution and Irrigation Systems Research Institute, Water Research Center, Cairo.
2. Director, Water Distribuiton and Irrigation Systems Researcxh Institute, Water Reecsearch Center, Cairo.
3. Chief Engineer and Head of on Farm Managemetn Department, Water Distribution and Irrigation Systems Research Institute, Water research centere, Cairo.
4. Professor, and former Head of Agricultural Enginering Department, Faculty of Agriculture, Cairo University.

Session 18 (Afternoon) **16:00-17:30**

Chair: **Magdy Omar** (Room A)

TS-8: (GERMANY) 16:00-16:45

What is new in Industrial CO2 Laser Systems for Micro Machining. Comparation with solid state & Excimer Lasers.

TS-9: **Klaus Pippert**, Lambda Physics Research (GERMANY) 16:45-17:30

Newest technologies of Excimer Lasers and Recent Applications.

Chair: **A.S. El Raei, S. Ibrahim** (Room B)

TS-10: **Thomas A. Driscoll**, Electro Optic Organization 16:00-16:45

A mobile LIDAR System for Atmospheric aerosole measurements.

Discussion and Demonstration. 16:45-17:30

VII-TUTORIAL SEMINARS

SATURDAY MARCH 26, 1994

Session 3 (Afternoon) **16:00-17:30**

Chair: **Ebtisam Havez** (Location Room A)
TS-1: **Erick Schoffel,** Mcpherson Technologies (USA) 16:00-16:45
Advances in UHV Spectrometers for XUV, VUV, visible and IR spectroscopy
Discussion and demonstration 16:45-17:30

Chair: **Moushira Salh El Dean** (Location Room B)
TS-2: **Edwin Keates,** (USA) 16:00-16:45
The Er: YAG Laser for application in Dentistry.
(Soft and hard tissue)
Discussion and demonstration 16:45-17:30

SUNDAY MARCH 27, 1994

Session 8 (Afternoon) **16:00-17:30**

Chair: **Abdel Kader Mansour** (Room A)
TS-3: **Roland Bonneau,** Bordeaux University (FRANCE) 16:00-16:45
Using Lasers for Studying the Mechanism of Photochemical Reactions.
Real Time Treatment PC computer 16:45-17:30

Chair: **Sayed Seif** (Room B)
TS-4: **Edwin Keates,** (USA) 16:00-16:45
The Er: YAG Laser for Gluocoma and ophthalmic applications
Discussion and demonstration 16:45-17:30

Chair: **A. Nasser** (Room C)
TS-5: **Werner Zieg,** Coherent , (USA) 16:00-16:45
Ultra Short pulses, what is new in production and application.
Discussion and Demonstration 16:45-17:30

MONDAY MARCH 28, 1994

Session 13 (Afternoon) **16:00-17:30**

Char: **Farouk Hammoda** (Room A)
TS-6: **Carlos B. Roundy,** Spiricon Inc. (USA) 16:00-16:45
. How to Maximize Laser Performance.
. How to Accurately Measure Laser Beam Profiles 16:45-17:30

Chair: **Shoukry Hunter** (Room B)
TS-6: **Edwin Keats,** (USA)
The Er: YAG laser for surgery 16:00-16:45
Discussion & Demonstration 16:45-17:30

Chair: **G.A. Fattah** (Room C) 16:45-17:30
TS-7: **Denis Rouanent,** Continuum (USA)
High Power Lasers for Laser Energy Research 16:00-16:45
Discussion & Demonstration 16:45-17:30

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **TS-1, Sat., 16:00**

Advancs in UHV Spctrometrs for XUV, VUV, Visibl, and IR spectroscopy.

Erick Schoffel
Mcphenson Tehnologies,
U.S.A.

Abstract:

Summary:

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **TS-3, Sun. 27, 16:00**

Using Lasers for Studying the Mechanism of Photochemical Reactions.

R. Bonneau,
U.A 348
du CNRS,
Univ. de Bordeaux 1,
(France).

Abstract:

Summary: Since the audience is expected to be largely interdiciplinary, the notion of mechanism of (photo) chemical reactions will be defined and the advantages (fundamental and practical) gained by elucidating such mechanisms will be pointed out in an introduction for non chemists participants. Then, the principle of the flash-photolysis technique and the typical set-ups will be described with emphasis on the advantages gained by using lasers in this applications. The various type of transient species, chemical processes or transient phenomena which can be (or have been) investigated with different types of lasers (Q-switched or Mode-locked, Sólid state, Excimers or others ....) will be briefly reviewed. Practical considerations concerning the energy, duration and wavelength of laser pulses in conjunction with the sensitivity response time and Signal/Noise characteristicss of detection systems will be discussed. The various steps of a typical study of a mechanism (identificaiton of the transient species, determination of reaction rate constants, calculation of activation energies and frequency factors, ...) will be shown on a couple of practical examples. If time permits, a demonstration of kinetic analysis of traces "Optical Transmission = f (time)" and of determination of transient spectra as a function of time will be given either in a real time treatment on a PC microcomputer or using a series of transparencies showing the various screens corresponding to the successive steps of the procedure.

References:

Professor Dr. Roland Bonneau is one of the pioneer chemists at Bordeaux University, who introduced lasers into chemistry. He is the Director of the CNRS lab. at the Uni. of Bordeaux coming out research using Pico-nano second facilities.

Lasers & Applications
Advances in Science, Medicine and Technology
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International Conference, March 26-30,1994 **TS-6, Mon. 28, 16:00**

How to Maximize Laser Performance

Carlos B. Roundy
Spiricon, Inc.
Logan, Utah U.S.A.

Abstract: The primary function of lasers is to provide a source of concentrated high power optical energy. Therefore, the actual distribution of this energy is of critical importance to nearly every application in use of lasers. In science applications such as physics and chemistry, in medical applications, in industrial applications, in commercial applications, and in communications, changes in the beam intensity profile can cause serious degradation in the performance of the laser.
The method of assuring optimum laser performance is to use a laser beam profiler to measure the laser output and enable optimisation of the profile. Various types of beam profilers are described, and state-of-the-art instruments using CCD cameras and self contained diagnostic computers, are demonstrated.

Summary:

References:

Lasers & Applications
Advances in Science, Medicine and Technology
Niles 94
International Conference, March 26-30,1994 **TS-6, Mon. 28, 16:45**

How to Accurately Measure Laser Beam Profiles

Carlos B. Roundy, Ph.D.
Spiricon, Inc.
Logan, Utah,
U.S.A.

Abstract: Matrix array CCD cameras are the ideal medium for performing laser beam profile measurements in many applictions. However, some characteristics of CCD cameras, such as low signal-to-noise ratio and drifting baseline, can cause substantial errors in performing beam profile measuremets.

Techniqués to compensate for these undesirable characteristics ae described. These techniques employ advanced digital signal processing to achieve an accuracy improvement of more than 10x with these cameras. Details of camera performance and correction methods are described.

Summary:

References:

NATIONAL INSTITUTE OF LASER ENHANCED SCIENCES ***NILES***
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LASERS & APPLICATIONS
ADVANCES IN SCIENCE, MEDICINE AND TECHNOLOGY
NILES 94
INTERNATIONAL CONFERENCE, MARCH 26 - 30, 1994

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ACKNOWLEDGEMENT

This conference has been morally supported and financially sponsored by the following institutions, foundations, companies and personnels, to whom the organizing committee is so grateful:

Cairo University, Ministry of International Cooperation, Open University Learning Center, University of Monofea, European Research office of US Army, Supreme Council of Universities, Atomic Energy Authority, GMC foundation, Giza Systems.

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THE
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LASERS & APPLICATIONS
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NILES 94

INTERNATIONAL CONFERENCE
MARCH 26-30, 1994

ADVANCED PROGRAMME **FEB. 26, 1994**

بسم الله الرحمن الرحيم

﴿ الله نور السماوات والأرض مثل نوره كمشكاة فيها مصباح المصباح في زجاجة الزجاجة كأنها كوكب درى يوقد من شجرة مباركة زيتونة لاشرقية ولاغربية يكاد زيتها يضئ ولو لم تمسسه نار نور على نور يهدى الله لنوره من يشآء ويضرب الله الأمثال للناس والله بكل شئ عليم ﴾

صدق الله العظيم

In The Name Of Allah

The Compassionate The Merciful

Allah is the light of the heavens and the earth. His light may be compared to a niche that enshrines a lamp, the lamp within a crystal of star-like brilliance. It is lit from a blessed olive tree neither estern nor western. Its very oil would almost shine forth, though no fire touched it. Light upon light; Allah guides to His light whom He will. Allah coins metaphors for men. He has knowledge of all things.

This translation first published 1956 by Penguin Classics Edited by E.V. Rieu

Under the Honorary Chair
of
Prof. Dr. MOUFEED SHEHAB President of Cairo Univ.

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Introductory Remarks

We are pleased that all of you can be here in Egypt on this very special occasion of the dedication of the National Institute of Laser Enhanced Siences (NILES). This conference is regarded as the premier International Conference held in Egypt to cover state-of-the-art developments in LASER concepts and applications. Future advances in nearly all fields are also part of the discussion planned.

The conference is unique in its scope: It covers both basic and applied research and applications and it exposes the multi-applications in medicine, environment, industry and other fields. With the twenty first century at the door steps, the conference is timely and we do hope it will stimulate new ideas and collaborations for the benefit of all nations.

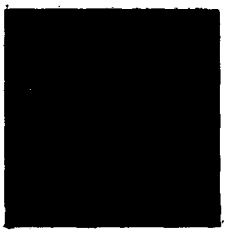
The program is exciting and contins contributions from allover the world by distinguished scientists, engineers and medical doctors. The format includes invited lectures, plannery lectures and keynote lectures - the first lecture will be presented by professor Nicolaas Bloembergen (Nobel Laureate) of Harvard University.

We take this opportunity on behalf of the organizing committee to welcome you to the land of Egypt - THE GIFT OF THE NILE for thousands of years!!

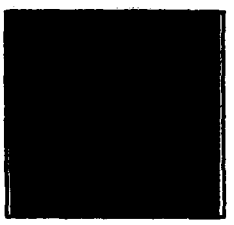
Conference Chairs

Lotfia El Nadi
Director, NILES
Cairo University, Egypt.

Ahmed Zewail
Linus Pauling Chair Professor
CALTECH, U.S.A.



Professor Ahmed ZEWAIL (Ph.D., D.Sc., hc) holds the Linus Pauling Chair at Caltech. He is a member of the National Academy of Sciences, fellow of the American Academy of Arts and Sciences, fellow of the Third World Academy of Sciences and a member of the European Academy of Arts, Sciences and Humanities. He has received many international distinguished honours and awards. He has given over 250 invited lectures including numerous named lectures. Over the years he has been a visiting professor to Academic Institutions in Europe, Egypt and U.S.A. He is the editor of six books, the current North American editor of chemical physics letters and International Series of Monographs in Chemistry (Oxford). The research interests of his group at Caltch are directed towards ultra fast lasers and their applications in Chemistry and Biography. Professor Zewail is proud of the achievements of his students and research scientists and with them he published some 270 articles.



Professor Dr. Lotfia EL NADI, Director of NILES has B.Sc. honour in Physics and Chemistry of Cairo Uni. (1956), M.Sc. of Birmingham University (U.K.) (1960), Ph.D. of Cairo University (1964). She started the scientific career at the Atomic Energy Authority contributing to the first nuclear research in Egypt. Since 1970 she joined Cairo Uni. as associate professor then promoted to full chair Physics Professor (1975). Recognizing the important future needs of the laser tech. she devoted her efforts since 1980 to establish the National Center of Laser & Applications (NCLA) at the Faculty of Science, which is now developed to the National Institute of Laser Enhanced Sciences (NILES) Cairo University. She also established the Topical Society of Lasers and Technology (TSLT) in 1987. She is a member of over 10 national and international scientific societies. Through her plan of technology transfer to Egypt, she implemented several bilateral international seminar, workshops, winter schools and agreements for the benefit of scientists, engineers, and medical doctors from the Egyptian Universities and institutions. With her research students she published over 50 serious papers. Her current interest concerns the associated phenomena of laser matter interaction as well as the development of solar pumped lasers for energy conversion.

ACTIVITIES

This conference has nine types of activities:

OCD-OPENING CEREMONY OF DEDICATION **(90 min)**

where a traditional inauguration festival will take place, followed by a quick visit to the laboratories of NILES and finalised by the President and Conference Chairs talks; highlighting the ethics and policy of innovative educational, research and development programmes of NILES.

AW-AWARDS **(15 min)**

where earlier efforts to initiate and support NILES will be presented. Golden & Silver Medals and Certificates of Excellency will be awarded to twelve members in acknowledgement of their scientific efforts and devotion.

OL-OPENNG LECTURE **(15 min)**

Given as an opening for the technical programme, how it would proceed and why it is been planned that way. Objectives of the conference.

KN-KEYNOTE LECTURES **(3 lectures - 45 min. each)**

delivered by Well-known Esteemed Scientists dealing with;
KN-1: Fundamentals of Science & Energy.
KN-2: Lasers in Medicine and Hygiene.
KN-3: Use of Lidar for Environmental and Agricultural studies.

PL- PLENARY LECTURES **(4 lectures - 30 min ea...)**

delivered by highly distinguished experts dealing with;
PL-1: Future of Laser Medicine and Surgery.
PL-2: Monitoring atmospheric Polutions by LIIDAR.
PL-3: Laser spectroscopic Applications in Medicine & Industry.

IL-INVITED LECTURES **(56 lectures 30 min each)**

Presented by Internationally well known Leaders, reviewing state-of-the-art developments in the theme areas of the conference, will be given in 3 parallel sessions;
IL-S: Laser concepts in Science & Energy.
IL-M: Laser concepts in Medicine & Hygiene.
IL-T: Laser concepts in Technology (Industry, Communication, Environment and Agriculture).

OP-ORAL PRESENTATION **(over 50 papers - 10 min each)**

Has been refereed by the scientific programme committee and accepted for oral presentation.

TS-TUTORIAL SEMINARS **(10 seminars, 45-90 min each)**

Tutorial Seminars covering, by technical presentation, the advantages of applying Laser technology in various fields of Basic and Applied Research are designed by experts in their fields. They will provide both lectures and displays using audiovisual aids and computers, as well as experimental demonstration. They will be provided in 3 parallel sessions during the after noon session.

EX-EXHIBITION of Recent, laser technology and associated equipments applied to both scientific and applied fields as well as books and journals will take place. The special Exhibit directory will be available on site.

SC-SOCIAL and CULTURAL PROGRAMMES

All through the coference days programmes will be available to extend a worm welcome to all participants and accompanying guests from all over the world:-
Social one-hour evening reception, University dinner, Nile cruise dinner, conference Banquet, tours to Cairo important sites such as the Egyptian Musuim, Pyramids and Sphinx, the Bazzar, Saccara, Salah ElDin Citadell will be arranged during the conference days. You can book the suitable place and time on site, in a way as to suite your technical activities.
A welcome Reception on 25 March at 21:00-22:00 free for all guests, will take place at Safir Hotel.

PROGRAMME OVERVIEW NILES 94 26-30 March

Day / Time	25/3 Fri	26/3 Saturday	27/3 Sunday	28/3 Monday	29/3 Tuesday	30/3 Wednesday
Morning 09:00	ARRIVALS TO CAIRO	REGISTRATION	INV. LEC A B C Session 4	INV. LEC A B C Session 9	INV. LEC A B C Session 14	INV. LEC A C Session 19
10:00		OPENING CEREMONY AT NILES	Room IL-S A OP-S IL-M B OP-M IL-T C OP-T	Room IL-S A OP-S IL-M B OP-M IL-T C OP-T	Room IL-S A OP-S IL-M B OP-M IL-T C OP-T	Room IL-S A OP-S IL-T C OP-T
11:30		COFFEE BREAK				
		DEDICATION OCD	KN-SC,E	KN-M,H	KN-EN,A	CLOSING
		AWARDS	Session 5	Session 10	Session 15	Session 20
12:30			QUICK LUNCH &		EXHIBIT	POSTCONF.
Afternoon 13:30		OPENING LEC. Session 1	PLENARY-1 Session 6	PLENARY-2 Session 11	PLENARY-3 Session 16	ACTIVITY
		TEA BREAK				
14:15		INV. LEC A B	INV. LEC A B C	INV. LEC A B C	INV. LEC A B	
		Room IL-S A OP-S IL-M B OP-M Session 2	Room IL-S A OP-S IL-M B OP-M Session 7	Room IL-S A OP-S IL-M B OP-M Session 12	Room IL-S A OP-S IL-M B OP-M Session 17	
		SOFT DRINK BREAK				
16:00		TUTORIAL-1 TUTORIAL-2 Session 3	TUTORIAL-3 TUTORIAL-4 Session 8	TUTORIAL-6,7 TUTORIAL-8 Session 13	TUTORIAL-9 TUTORIAL-10 Session 18	
17:30			FREE TIME			
EVENING 19:30	WELCOME	UNIVERSITY DINNER	SOCIAL RECEPTION NILE CRUISE DINNER	FREE	CONFERENCE BANQUET	

N.B. (1) Morning session of 26/3/94 will be held at NILES new premises.
(2) All sessions starting afternoon session 13:30 of 26/3/94 will be held at the OPEN UNIVERSITY LEARNING CENTER OLC, few meters away from NILES.

NILES 94 TECHNICAL PROGRAMME

The International Conference Technical Programme is featuring three themes comprising basic and applied advances in Science & Energy, Medicine & Hygiene and Technology.

The Science & Energy theme includes eight sessions with tentative track layout possibly divided into, laser in plasma diagnostics, ultrafast and high intensity laser phenomena, lasers in chemistry, new lasers and laser matter interaction..

The Medicine & Hygiene theme could possibly be classified in lasers in dentistry, lasers in ophthalmology, lasers in diagnostics and surgery and lasers in dermatology which are included in seven sessions.

The Technology theme comprises laser applications in Industry, communication, Environmental and agricultural studies. The three sessions are organized so as to include invited talks and oral presentations dealing with more or less the same field. We had to group them due to with-drawal of some invited speakers.

Hope-fully the following lists clarify the daily schedule for each of these themes.

The Technical Programme will be located in the Open Learning Center OLC building of Cairo University, few meters from NILES. It will start at 13:30 on Saturday March 26, 94 with the opening lecture of Professor Ahmed ZEWAIL at the conference room of OLC. The closing session will be held at 11:30 on Wednesday March 30, where conclusions could be drawn about benefits gained from this conference and decisions for future activities could be decided. Forms will be distributed during the conference to fill up your impressions and advice to asses the success of this conference. We look forward to follow your kind valueable remarks.

SCHEDULE NILES 94 TECHNICAL PROGRAMME

I– OPENING LECTURE — Location Conference Room OLC

SATURDAY MARCH 26, 1994

Session 1 (Afternoon) **13:30-14:00**

OL- **Ahmed Zewail,** California Institute of Technology (USA)
objectives of the conference

II- KEYNOTE LECTURES — Location Conference Room OLC

SUNDAY MARCH 27, 1994

Session 4 (Morning) **11:30-12:30**

Chairman: **Ahmed Zewail.**

KN-1 **N. Bloembergen,** Noble laureate, Harvard University (USA),
Laser Material Interactions: Fundamentals & Applications.

MONDAY MARCH 28, 1994

Session 9 (Morning) **11:30-12:30**

Chairman: **Sayed H. Seif.**

KN-2 **H. Van Den Bergh,** Swiss Federal Institute of Technology (Switzerland)
Lasers in Medicine.

TUESDAY MARCH 29, 1994

Session 14 (Morning) **11:30-12:30**

Chairman: **A.S. ELRaei**

KN-3 **Sune Svanberg,** Lund Institute of Technology, (Sweden)
Monitoring of Atmospheric Pullutants and Vegetation Stress Using Laser Techniques.

III– PLENARY LECTURES — Location Conference Room OLC

SUNDAY MARCH 27, 1994

Session 6 (Afternoon) **13:30-14:00**

Chairman: **Shoukry Hunter.**

PL-1 **Leon Goldman,** United States medical Center, San Diego (USA)
The Glorious Future of Laser Medicine and Surgery.

MONDAY MARCH 28, 1994

Session 11 (Afternoon) **13:30-14:00**

Chairman: **Farouk Ismail.**

PL-2 **L. Woste,** Freie Universitat Berlin (GERMANY)
Monitoring Atmospheric Polutions by LIDAR.

TUESDAY MARCH 29, 1994

Session 16 (Afternoon) **13:30-14:00**

Chairman: **M. Geneedy**

PL-3 **C. Grey Morgan,** Swansea University (UK)
Laser Spectroscopic Applications in Medicine and Industry.

IV CONFERENCE THEME SCIENCE & ENERGY (Location Room A OLC)

Programme Chair	: Eduard HINTZ, Institute of Plasma Physics, KFA Julich	(GERMANY)
Programme Committee	: Ebtisam HAVEZ, Farouk HAMMODA and A. NASSER	(NILES)

SATURDAY MARCH 26, 1994

Session 1 (SEE PLENARY SESSION LECTURES) 12:30-14:00

TEA BREAK (Location Cafeteria of OLC 3rd floor) 14:00-14:15

Session 2 (Afternoon) **14:15-15:45**

Theme Chairs: **Mohamed El Nady, M. Masoud.**

IL-S-1 **Eduard Hintz**, Institute Plasma Physics, KFA (GERMANY) 14:15-14:45
Application of LIF of Atoms and Ions to the Study of Glow Discharge.

IL-S-2 **H.F. DOBELE**, University Gesamthochschule Essen (GERMANY)
Laser Plasma Diagnostics Using TWO Photon Excitation. 14:45-15:15

OP-S-1 **Sh.M. Khalil**, Plasma Physics Dept., AtomicEnergy Authority (EGYPT) 15:15-15:25
Interaction of waves of Differnet Polarization.

OP-S-2 **M.Atta, NILES**, Cairo University, (EGYPT) 15:25-15:35
Microarc Plasma Diagnostics Using LIF Techniques.

OP-S-3 **Sh. M. Khalil**, Plasma Physics Dept., AtomicEnergy Authority (EGYPT) 15:35-15:45
Interaction of waves of Similar Polarization.

SOFT DRINK BREAK (Location Cafeteria OLC 3rd floor) 15:45-16:00

Session 3 (SEE TUTORIAL SEMINARS) 16:00-17:30

SUNDAY MARCH 27, 1994

Session4 (*Morning*) **9:00-11:15**

Theme chairs: **H.F. Dobele, Henry Kapteyn.**

IL-S-3 **V. Mckoy**, Calfornia Institute of Technology (USA) 9:00-9:30
Laser Photo Electron Spectroscopy.

IL-S-4 **Margret Murnane**, Washington State University (USA) 9:30-10:00
Ultra Short Pulse Laser and applications.

IL-S-5 **Roman Sobolewski**, Laboratory of Laser Energetics, 10:00-10:30
Rochester University (USA)
Fembosecond Lasers in Science and Engineering.

OP-S-4 **S.I. Hassab El Naby**, Air Defence College & NILES (EGYPT) 10:30-10:40
The Compression Mechanism of th Passive Mode-Locked Ti-sapphire laser.

OP-S-5 **A. Nasser**, Faculty of Science & NILES (EGYPT) 10:40-10:50
Laser Initiated Surface Pressure.

OP-S-6 **A.F. El Sherbini**, Faculty of Science & NILES (EGYPT) 10:50-11:00
Laser Produced Carbon Plasma.

OP-S-7 **G. Abdel Latif**, Faculty of Science & NILES (EGYPT) 11:00-11:10
Diagnostics of Laser Produced Soft-x-rays.

COFFEE BREAK (Location cafeteria of OLC 3rd floor) 11:15-11:30

Session 5 (SEE KEYNOTE LECTURES) 11:30-12:30

QUICK LUNCH & EXHIBITION (Location OLC & Univ. Guest House) 12:30-13:30

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Session 7 (Afternoon) **14:15-15:45**

Theme charis: **V. Mckoy, Roman Sobolowski.**

IL-S-6 **Henry Kapteyn,** Washingon University (USA) **14:15-14:45**
High Intensity Physics with 20 Femto-second Laser Pulses.

IL-S-7 **Peter Bogen,** Institute of Plasma Physics, KFA (GERMANY) **14:45-15:15**
LIF Experiments in the VUV.

IL-S-8 **Eduard Fabre,** Ecole Polytechnique (LULI) (FRANCE) **15:15-15:45**
Laser Fusion Overview.

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MONDAY MARCH 28, 1994

Session 9 (Morning) **9:00-11:15**

Theme chairs: **Abdel Kader Mansour, Roland Bonneau.**

IL-S-9 **J.P.Mitttal,** Bhaba Atomic Research Centre (INDIA) **9:00-9:30**
Lasers in Chemistry & Chemistry in Lasers.

IL-S-10 **J.C. Whitehead,** University of Manchester (UK) **9:30-10:00**
The Development of short-Wavelength Chemical lasers.

IL-S-11 **W. Hutner,** Ulm University (GERMANY) **10:00-10:30**
High Resolution Molecular Laser Applications in External Fields.

IL-S-12 **Ideisan Abu Abdoun,** King Fahd University of **10:30-11:00**
Petrolium and Minerals (SAUDI ARABIA)
Photoinitiators for Polymerization Reactions.

OP-S-8 **M. Farhoud,** Alexandria Univ. (EGYPT) **11:00-11:15**
Non linear effect for Solute - Solvent Interaction in Aqueous Solutions.

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Session 12 (Afternoon) **14:00-15:45**

Theme chairs: **Sabry Abdel Mottaleb, J.P. Mittal**

IL-S-13 **Aldo Mele,** University La Sapienza Roma (ITALY) **14:00-14:30**
Evolution ad Dynamics of the laser Ablated Plume.

IL-S-14 **Helmy El Nagdy,** Cairo Univ. & NILES (EGYPT) **14:30-14:50**
Advances of Laser Methods in Chemistry.

Il-S-24 **Sabry A. Mottaleb,** Ain Shams Univ. (EGYPT) **14:50-15:10**
photophyscal Properties of Some Laser Dyes

OP-S-9 **Maram. T. Hussine,** Cairo Univ. NILES (EGYPT) **15:10-15:20**
Studies on the Optical Properties of Some Ccoumarines as Laser Dyes

OP-S-10 **G.E. Hassan,** Tanta Univ. (EGYPT) 15:20-15:30
Measurement of the Physical Properties of Cyclohexane using Laser Interferometric Technique.
OP-S-11 **Kawser Kassab,** Cairo Univ. NILES (EGYPT) 15:30-15:40
Synthesis of new Heterocyclic Coumarine Derivatives as Laser Dyes.
OP-S-12 **Reda A. El Koramy,** Assuot Univ. (EGYPT) 15:40-15:50
Dependence of the Complete Absorption on the Absorbent Concentration.

SOFT DRINK (Locations cafeteria OLC 3rd floor) 15:45-16:00

Session 13 (SEE TUTORIAL SEMINARS) 16:00-17:30

TUESDAY MARCH 29, 1994

Session 14 (Morning) 9:00-11:15

Theme chairs: **Latifa Al Houty, W. Hutner.**
IL-S-15 **P. Dhez,** Univ. Paris Sud (LSAI) (FRANCE) 9:00-9:30
Present status of X-UV lasers: New Lasing Lines Towards "Table Top" system.
IL-S-16 **Frank Tittel,** Rice Univ. (USA) 9:30-10:00
New Opportunities in IR Laser Spectroscopy.
IL-S-17 **B. Chai,** Univ. of Central Florida (USA) 10:00-10:30
New Solid State Laser Materials in Research and applications.
IL-S-18 **Latifa Al Houty,** Qatar Univ. (QATAR) 10:30-11:00
Prospects of Laser Science at Qatar University.
OP-S-13 **Essam Hassan,** Cairo Univ., NILES (EGYPT) 11:00-11:15
Solar Pumped Iodine compound laser.

COFFEE BREAK (Location cafeteria OLC 3rd floor) 11:15-11:30

Session 15 (SEE KEYNOTE LECTURES) 11:3012:30

QUICK LUNCH (Location Cafeteria OLC Univ. Guest House) 12:30-13:30

Session 16 (SEE PLENARY LECTURES) 13:30-14:00

TEA BREAK (Location cafeteria OLC 3rd floor) 14:00-14:15

Session 19 (Afternoon) 14:15-015:45
Theme chairs: **Frank Tittel, Aldo Mele**
IL-S-19 **Sohair Negm,** Zagazig University (EGYPT) 14:15-14:45
Comparative Spectra Response of PTD and PAS Techniques.
IL-S-20 **Lotfi Ismail,** Qatar Univ. (Qatar) 14:45-15:15
Novel Nitrogen Laser in Ring Cavity.
IL-S-21 **H. Welling,** Univ. of Hannover (USA) 15:15-15:45
Diode pumped solid state lasers operating at low Amplitude and Frequency Noise.

SOFT DRINK (Location cafeteria OLC 3rd floor) 15:45-16:00

Session 18 (SEE TUTORIAL SEMINAR) 16:00-17:30

THURSDAY MARCH 30 1995

Session 19 (Morning) **9:00-11:15**

Theme chairs: **Peter Dhez, A.A.Hamza**

IL-S-22 **A.A. Hamza,** Mansourah Univ. (EGYPT) 9:00-9:30
Interferometry & Future Expectations.

IL-S-23 **M.A. Khashan,** Ain Shams Univ. (EGYPT) 9:30-10:00
Determination of Level Population from the Dispersion Measurements in Doublet-line Wings.

OP-S-14 **A.R. El Samman,** Al Azhar Univ. (EGYPT) 10:00-10:15
Quantum Statistics of a 3-Level Atom + Multiphoton Two-Mode Field (1) Photon bunching & Antibunching.

OP-S-15 **M. Omar,** Cairo Univ., NILES (EGYPT) 10:15-10:30
Photo Deflection Studeis from Microarc Produced Plasma.

OP-S-16 Afaf Gadallah, Assiut Univ. (EGYPt) 10:30-10:45

COFFEE BREAK (Location cafeteria OLC 3rd floor) **11:15-11:30**

Session 20 CLOSING SESSION **11:30**

V- CONFERENCE THEME MEDICINE & HYGIENE (Location Room B OLCM)

Programme Chair: David Gartry, Moorfield Eye hospital, Institute of Ophthalmology, London (UK).
Programme Committee: Sayed SAIF, Moushera S. ELDEAN, Shoukery HUNTER, Nadia SALEH

SATURDAY MARCH 26, 1994

Session 1 (SEE PLENARY SESSION LECTURES) **13:30-14:00**

TEA BREAK (Location cafeteria of OLC 3rd floor) **14:00-4:15**

Session 2 (Afternoon) **14:15-15:45**

Theme chairs: **Tarek Abbas, Hatem Abdulrahman**

IL-M-1 **Mohamed Sharawy**, Medical College of Gorgia (USA) 14:15-14:35
Experimental Approach to the Study of Laser Application in Dentistry.

IL-M-2 **Harvey Wigdor**, Ravenswood Hospital Medical Center of Chicago (USA) 14:35-15:45
Laser in Dentistry.

IL-M-3 **Tatjana Dostalova**, Institue of Dental Research (CZECH) 14:15-15:15
The Principle of Noninvasive Ablation with Er: YAG laser in Dentistry

OP-M-1 **M.S.EL ATTAR**, Faculty of Dentistry, Alexandria University (EGYPT) 15:15-15:25
Evaluation of the effect of using soft Laser on Osseointegration of Blade implants.

OP-M-2 **Mokhtar Abdulatif**, Faculty of Dentistry, Cairo Univ. (EGYPT) 15:25-15:35
CO2 Laser in Dentistry.

OP-M-3 **Moushira S. Eldean**, Faculty of Dentistry & NILES 15:35-15:45
Future Applications of Lasers in Dentistry Cairo Univ.

Soft Drink Break (location cafetrria OLC third floor) **15:45-16:00**

Session 3 (See TUTORAIAL SEMINARS) **16:00-17:30**

SUNDAY MARCH 27, 1994

Sessio 4 (Morning) **9:00-11:15**

Theme chairs: **David Gartry, Abdel Latif Siam, Sayed Saif.**

IL-M-4 **David Gartry**, Moorfield Hosptial, Institute of 9:00-9:30
Ophthalmology, London (UK)
Eximer Laser Photorefractive Keratactomy for Moyopia, is it Really the Bottom Line?

IL-M-5 **Abdel Latif Siam**, Faculty of Medicine, Ain Shams Univ. (EGYPT) 9:30-9:50
Ophthalmic Appliations of Modern Diode Lasers.

IL-M-6 **Medhat El Hennawi**, Faculty of Medicine, Alexandria Univ. (EGYPT) 9:50-10:10
Endoscopic Laser Surgery

OP-M-4 **Sayed Saif**, Faculty of Medicine & NILES, Cairo Univ. (EGYPT) 10:10-10:30
Excimer Laser in Anisometropia.

IL-M-7 **Beshr Kenawy**, Faculty of Medicine, Cairo Univ. (EGYPT) 10:30-10:50
Excimer Photorefractive Keratactomy in Myopia.

OP-M-5 **G. El Mashad**, Zagazig University (EGYPT) 10:50-11:10

COFFET BREAK (Location Caferteria OLC 3rd floor) **11:15-11:30**

Session 5 (SEE KEYNOTE LECTURES) **11:30-12:30**

Quick Lunch & Exhibit (Location OLC & Univ. Guest House) **12:30-13:30**

[illegible] 13:30-14:00

TEA BREAK (Location cafeteria OLC 3rd floor) 14:00-14:15

Session 7 (Afternoon) **14:15-15:45**

Theme Chairs: **Ionnis Pallikaris, Nabil Sabry, Sayed Saif.**

IL-M-8 **Ionnis Pallikaris,** University of Crete (GREECE) 14:15-14:45
New Laser Directions in Ophthalmology.

IL-M-9 **Nabil Sabry,** Faculty of Medicine, Alexandria Univ. (EGYPT) 14:45-15:00
New Ophthalmic Lasers.

IL-M-10 **Ahmed Barrada,** Faculty of Medicine, Alazhar Univ. (EGYPT) 15:00-15:15
Photorefractive keratactomy.

OP-M-6 **Sayed Saif,** Faculty of Medicine & NILES, Cairo Univ. (EGYPT) 15:15-15:25
Excimer Laser Phtorefractive Keratactomy

OP-M-7 **H. Hassanin,** Zagazig Univ. (EGYPT) 15:25-15:35
Argon Laser RIOR to Nd:YAG Iridectomy.

OP-M-8 **Zeinab El Senbary,** Cairo University (EGYPT) 15:35-15:45
Nd: YAG Laser in Cataract Surgery.

SOFT DRINK BREEK 15:45-16:00

Session 8 (SEE TUTORIAL SEMINAR) 16:00-17:30

MONDAY MARCH 28, 1994

Session 9 (Morning) **9:00-11:15**

Theme Chairs: **Ahmed Shafik, Shoukry Hunter**

IL-M-11 **Ramashandra Dasari,** Massachustts Inst. of Tech. (USA) 9:00-9:30
Application of Lasers in Biomedicine.

IL-M-12 **Shoukry Hunter,** Faculty of Medicine, Cairo University (EGYPT) 9:30-10:00
The Use of Lasers in Oesohpagogastric Carcinoma.

IL-M-3 **Tayyba Hassan,** Harvard Univ. Medical School (USA) 10:00-10:20
Photochemical Targeting of Cancer Cells.

IL-M-14 **Amr Helmy,** Liver Institute Monofiya Univ. (EGYPT) 10:20-10:40
Liver Resection and Laser Hyper thermia.

OP-M-9 **Hisham El Gohary,** NILES, Cairo Univ. (EGYPT) 10:40-10:50
Biliary Laser Lithotripsy Using Q-switched
Nd:YAG Laser Combined Wavelengths.

OP-M-10 **Ahmed Bedair,** Cairo University (EGYPT) 10:50-11:05
Transuretheral Laser Prostatectomy

IL-M-15 **Essam Yacout El Sahwi,** Alexandria Univ. (EGYPT) 11:05-11:15
Lasers in Angiomas.

COFFEEE BREAK (Location cafeteria OLC 3rd floor) 11:15-11:30

Session 10 (SEE KEYNOTE LECTURES) 11:30-12:30

QUICK LUNCH & EXHIBIT (Location OLC & Univ. Guest House) 12:30-13:30

Session 11 (SEE PLENARY LECTURES) 13:30-14:00

TEA B REEK (Location Cafeteria OLC 3rd floor) **14:00-14:15**

Session 12 (Afternoon) **14:15-15:45**

Theme Chairs: **Karsten Koenig, Maged El Shannawy.**

IL-M-16 **Karsten Koenig,** University of California, Irvine (USA) 14:15-14:45
Laser Induced Auto fluorescence in Medical Diagnosis

IL-M-17 **Maged El Shennawy,** Faculty of Medicine, Cairo Univ. (EGYPT)
Lasers in Cancer Laryhx. 14:45-15:05

IL-M-18 **Katerina Svanberg,** Lund University (SWEDEN) 15:05-15:25
Tissue Diagnosis and PDT using Lasers.

IL-M-19 **Sune Svanberg,** Lund Technical Institute (SWEDEN) 15:25-15:40
Time Resolved Spectroscopic Technques in Laser Medicine.

OP-M-11 **Essam El Nezamy,** Cairo University (EGYPT) 15:40-15:50
Laser Recanalization of post corrosive stricture of the Oesophagus.

SOFT DRINK BREAK (Location Cafetria OLC 3rd floor) **15:45-16:00**

Session 13 (SEE TUTORIAL SEMINARS) **16:00-17:30**

TUESDAY MARCH 29, 1994

Session 14 (Morning) **09:00-11:15**

Theme Chairs: **U. Hohenleutner, M. Abdel Moniem, M. Nada.**

IL-M-20 **Hohenleutner,** University of Regensburg (GERMANY) 09:00-09:30
Laser in Dermatology.

IL-M-21 **Amal Kurban,** Boston University (USA) 09:30-10:00
An update of the use of Laser in Dematology.

IL-M-22 **M. Abdel Moneim,** Al-Azhar University (EGYPT) 10:00-10:30
Laser for Dermatologic Purposes.

IL-M-23 **Talal Abdel Rahim,** University of Regensburg (GERMANY) 10:30-11:00
Nd-YAG Laser for Verruca Vulgaris.

COFFEE BREAK (Location Cafeteria OLC 3rd floor) **11:15-11:30**

Session 15 (SEE KEYNOTE LECTURE) **11:30-12:30**

QUICK LUNCH & EXHIBIT (OLC cafeteria & Univ. Guest house) **12:30-13:30**

Session 16 (SEE PLENARY LECTURE) **13:30-14:00**

TEA BREAK (Location cafeteria OLC 3rd floor) **14:00-14:15.**

Session 17 (Afternoon) **14:15-15:45**

Theme Chairs: **Amal Kurban, Nadia Saleh.**

OP-M-12 **Amal Kurban,** Boston University (USA) 14:15-14:45
Laser treatment of cutaneous Malignancies.

OP-M-13 **Bakr El Zawahry,** Cairo University (EGYPT) 14:45-15:00
Argon Laser in Dermatology.

OP-M-14 **Talal Abdel Raheem,** University of Regensburg (GERMANY)
Complications of Flash Lamp Pulsed dye Laser. 15:00-15:15

OP-M-15 **Nadia Saleh,** Faculty of Medicine & NILES, Cairo Univ. (EGYPT) 15:15-15:30
Prospectives of Lasers in Dermatology.

Programme chair: **SUNE SVANBERG,Lund Technical Institute (SWEDEN)**
Programme Committee: **Abdel Kader Mansour**, A.S. ELRAEI, S. IBRAHIEM, G.A.FATTA, M. OMER (NILES)

SUNDAY MARCH 27, 1994

Session 4 (Morning) **9:00-11:15**

Theme chairs: **C. Grey Morgan, Hassan Talaat.**

IL-T-1 **J. Uhlenbusch**, Heinrich - Heine Univ. Dossel. (GERMANY) 9:00-9:30
High Power CO2 laser for research and applications.

IL-I-2 **Z. Mucha**, Polish Academy of Sciences (POLAND) 9:30-10:00
Advanced Technology of Laser Micromachining.

OP-T-1 **MK. El Adawi**, Ain Shams Univ. (EGYPT) 10:00-10:20
Laser Heating of a two-layer System with constant Surface Absorptance, An Exact Solution.

OP-T-2 **M. Atia**, NILES, Cairo Univ. (EGYPT) 10:20-10:30

OP-T-3 **S.W. El Moogy**, NILES, Cairo Univ. (EGYPT) 10:30-10:40
Deposition of D.L.C. by N2-Laser ablation of graphite.

OP-T-4 **Ahmed Asaad**, NILES, Cairo Univ. (EGYPT) 10:40-11:00
Laser Beam Welding for two Metal Flat Surfaces.

OP-T-5 **M. Kotab**, NILES, Cairo Univ. (EGYPT) 11:00-11:15
N2-Laser Beam interaction with Ti and TiC targets.

COFFEE BREAK (Location cafeteria OLC 3rd floor) **11:15-11:30**

Sessions (SEE KEYNOTE LECTURES) **11:30-12:30**

QUICK LUNCH (Location cafeteria OLC & Univ. Guest House) **12:30-13:30**

Session 6 (SEE PLENARY LECTURES) **13:30-14:00**

MONDAY MARCH 28, 1994

Session 9 (Morning) **9:00-11:15**

Theme chairs: **J. Uhlen busch, M. Mele**

IL-T-3 **Michel Voos**, Ecole Normal Superieur (FRANCE) 9:00-9:30
Semiconductor Quantum Well Lasers and Communication.

L-T-4 **Hassan Talaat**, Ain Sham University (EGYPT) 9:30-10:00
Raman Scattering/A Versatile tool for Characterization of Semiconductor Hetero-Structures.

OP-T-6 **Khairia Darwish**, Faculty of Science, Cairo Univ. (EGYPT) 10:00-10:20
Radative Recombination in GaP Doped with Nitrogen.

OP-T-7 **Tarek A. Ramadan**, Faculty of Engineering, Ain Shams Univ. (EGYPT) 10:20-10:40
Carrier Collection in Semiconductor Single Quantum Well Structure.

OP-T-8 **M. Mounir**, Faculty of Science, Cairo Univ. (EGYPT) 10:40-11:00
A study of the Luminescence spectra of GaInP.

OP-T-9 **M. Hanafi**, NILES, Cairo Univ. (EGYPT) 11:00-11:15
Magneto-optic Recording.

COFFEE BREAK (Location cafeteria OLC 3rd floor)	**11:15-11:30**
Session 10 (SEE KEYNOTE LECTURES)	**11:30-12:30**
QUICK LUNCH (Location cafeteria OLC & Univ. Guest House)	**12:30-13:30**
Session 11 (SEE PLENARY LECTURES)	**13:30-14:00**

TUESDAY MARCH 29, 1994

Session 14 (Morning) **9:00-11:15**

Theme chairs: **Sune Svanberg, A.S. El Raei.**

IL-T-5 **L. Woste**, Freie Univ. Berlin (Germany) 9:00-9:30
Monitoring atmospheric Polutions by LIDAR.

IL-T-6 **Dan J.** Radecki the Electro Optic Organization (USA) 9:30-10:00
An IR absorption Spectrometer for Measuring Natural Gas Constituents.

OP-T-10 **M. Walid**, NILES, Cairo Univ. (EGYPT) 10:00-10:15
Propagation of High Power Nd: YAG Laser in Water and Water Vapour

OP-T-11 **Helmy S. Hassan**, NILES, Cairo Univ. (EGYPT) 10:15-10:30
Detection of Corn Kernal Defects Using Visible Laser Inspection Technique.

OP-T-11 **A. Rahman Elwi**, NILES, Cairo Univ. (EGYPT) 10:30-10:45
Policy Regulations to Control Safety Aspects of Using Laser Systems in Egypt.

OP-T-12 **S. Ibrahime, NILES, Cairo Univ. (EGYPT)** **10:45-11:00**
Analyss of LIDAR Spectroscopic Data.

COFFEE BREAK (Location cafeteria OLC 3rd floor)	**11:15-11:30**
Session 15 (SEE KEYNOTE LECTURES)	**11:30-12:30**
QUICK LUNCH (Location cafeteria OLC & Univ. Guest House)	**12:30-13:30**
Session 16 (SEE PLENARY LECTURE)	**13:30-14:00**

TECHNICAL SESSIONS

SATURDAY MARCH 26, 1994

Session 3 (Afternoon) **16:00-17:30**

Chair: **Ebtisam Havez** (Location Room A)
TS-1: **Erick Schoffel,** Mcpherson Technologies (USA) 16:00-16:45
Advances in UHV Spectrometers for XUV, VUV, visible and IR spectroscopy
Discussion and demonstration 16:45-17:30

Chair: **Moushira Salh El Dean** (Location Room B)
TS-2: **Edwin Keates,** (USA) 16:00-16:45
The Er: YAG Laser for application in Dentistry.
(Soft and hard tissue)
Discussion and demonstration 16:45-17:30

SUNDAY MARCH 27, 1994

Session 8 (Afternoon) **16:00-17:30**

Chair: **Abdel Kader Mansour** (Room A)
TS-3: **Roland Bonneau,** Bordeaux University (FRANCE) 16:00-16:45
Using Lasers for Studying the Mechanism of Photochemical Reactions.
Real Time Treatment PC computer 16:45-17:30

Chair: **Sayed Seif** (Room B)
TS-4: **Edwin Keates,** (USA) 16:00-16:45
The Er: YAG Laser for Gluocoma and ophthalmic applications
Discussion and demonstration 16:45-17:30

Chair: **A. Nasser** (Room C)
TS-5: **Werner Zieg,** Coherent , (USA) 16:00-16:45
Ultra Short pulses, what is new in production and application.
Discussion and Demonstration 16:45-17:30

MONDAY MARCH 28, 1994

Session 13 (Afternoon) **16:00-17:30**

Char: **Farouk Hammoda** (Room A)
TS-6: **Carlos B. Roundy, Spiricon Inc.** (USA) 16:00-16:45
. How to Maximize Laser Performance.
. How to Accurately Measure Laser Beam Profiles 16:45-17:30

Chair: **Shoukry Hunter** (Room B)
TS-6: **Edwin Keats,** (USA)
The Er: YAG laser for surgery 16:00-16:45
Discussion & Demonstration 16:45-17:30

Chair: **G.A. Fattah** (Room C) 16:45-17:30
TS-7: **Denis Rouanent,** Continuum (USA)
High Power Lasers for Laser Energy Research 16:00-16:45
Discussion & Demonstration 16:45-17:30

TUESDAY MARCH 26, 1996

Session 18 (Afternoon) **16:00-17:30**

Chair: **Magdy Omar** (Room A)

TS-8: (GERMANY) 16:00-16:45
What is new in Industrial CO2 Laser Systems for Micro Machining. Comparation with solid state & Excimer Lasets.

TS-9: **Klaus Pippert,** Lambda Physics Research (GERMANY) 16:45-17:30
Newest technologies of Excimer Lasers and Recent Applications.

Chair: **A.S. El Raei, S. Ibrahim** (Room B)

TS-10: **Thomas A. Driscoll,** Electro Optic Organization 16:00-16:45
A mobile LIDAR System for Atmospheric aerosole measurements.
Discussion and Demonstration. 16:45-17:30

GENERAL INFORMATION

Registration.
The registration area will be located in the new premises of NILES on:

Saturday 26 March	8:30-12:30

Then it will be located at the Open Learning Centre (OLC) building of Cairo University on the 1st floor. Registration hours are:

Saturday 26 March	14:00-15:00
Sunday 27 March	9:00-12:00
Monday 28 March	9:00-12:00

Hotel Accommodations.
Please use the hotel Reservation form sent with the first call to ensure your accommodation.
NILES 94 will bear the living expenses at Safir Hotel for only the Invited Speakers starting afternoon Friday March 25 until noon of Wednesday 30th of March 1994.

Message Desk
Message boards will be available in the registration and conference area.

Chair/Speaker's Audiovisual Desk.
Session Chairs and speakers are asked to report to the Audio-visual Desk near the Registration area for a quick review of equipments they need. They can check in their slides or there material 30 minutes before their presentation.

Coffee, tea and Soft Drink will be provided for the attendees during the breaks as scheduled.

Conference Venue.
The conference will start with the Opening Ceremony of the Dedication of NILES at the new premises in Cairo University Compus.

The sessions starting 13:30 will be located at the first and second floor of the Open Learing Centre (OLC) of Cairo University till the end of the conference.
(Please see the map enclosed).

Meals.
Quick lunch every day of the conference is included in the registration fee. The buffet will be located at the OLC Cafeteria of 3rd floor or at the University Guest House each from 12:30-13:30.

There are also many restaurants within a short walking distance of the conference venue for those who would like to bear their own expenses.

For Sight Seeing and Archaeological Visits, a Tourist Desk Will be Available Near the Registration Area Where You Can Get All Information Needed.

Topical Society of Laser Science and Technology.

The TLST invite you to join the membership where the following benefits could be conveyed to you:
* The Journal of Laser Science and Technology issued Quarterly per year at low price.
* Newsletter free of charge issued monthly.
* Up-to-date information about laser activities in the world (conf-meeting-workshops- sym. new book etc...).

You can get all information form the TLST representative Desk near the registration area.

NATIONAL INSTITUTE OF LASER ENHANCED SCIENCES ***NILES***
CAIRO UNIVERSITY

LASERS & APPLICATIONS
ADVANCES IN SCIENCE, MEDICINE AND TECHNOLOGY
NILES 94
INTERNATIONAL CONFERENCE, MARCH 26 - 30, 1994

ORGANIZERS

CAIRO UNIVERSITY
NATIONAL INSTITUTE OF LASER ENHANCED SCIENCES
TOPICAL SOCIETY OF LASER SCIENCE. (EGYPT)
SUPREME COUNCIL OF UNIVERSITIES. (EGYPT)

ACKNOWLEDGMENT

This conference has been morally supported and financially sponsored by the following institutions, foundations, companies and personnels, to whom the organizing committee is so grateful:

Cairo University, Ministry of International Cooperation, Open University Learning Center, University of Monofea, European Research office of US Army, Supreme Council of Universities, Atomic Energy Authority, GMC foundation, Giza Systems.

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